Indian Archaeology

1998-99 **A Review**







INDIAN ARCHAEOLOGY 1998-99
-A REVIEW

PUBLISHED BY THE DIRECTOR GENERAL
ARCHAEOLOGICAL SURVEY OF INDIA
JANPATH, NEW DELHI
2004

Cover: *l and 2, Bisokhar: porch pillar and sculptural depiction of raising of Govardhana hill*
3, Shyam Sundar Tilla: terracotta plaque with flying figures

Price : Rs. 700.00

PRINTED AT : Public Printing (Delhi) Services, C-80, Okhla Industrial Area, New Delhi-110020

PREFACE

I am happy to place before the scholars this issue of IAR 1998-99 with reports on (1) Explorations and Excavations (2) Epigraphy (3) Numismatics & Treasure Trove (4) Other Important Discoveries (5) Museums (6) Architectural Survey (7) Preservation of Monuments (8) Archaeological Chemistry (9) Archaeological Gardens and (10) Publications. These reports are the results of field work and researches conducted during the period under review, by the various offices of the Survey, State Departments of Archaeology, Universities, Museums and Research Institutions.

For bringing out this issue, I would like to place on record my thanks to Dr. Amarendra Nath, Director (Publication) and Dr. Arundhati Banerji, Superintending Archaeologist (Publication) for their untiring efforts in bringing out this issue. S.A. (Publication) has been putting in a great deal of hard work at every stage of the publication, which deserves special mention.

Thanks are also due to Hoshiar Singh, Production Officer, Dr. Piyush Bhatt and Gunjan Kumar Srivastava, Assistant Archaeologists, in addition to all the members of Publication Section for their hard work and constant vigil at various stages of the publication of the issue. For improving the line drawings wherever needed, I thank Vijay Kumar, Chief Artist, Rakesh Chander, Senior Artist, Baldev Singh, Draftsman, Grade I and Puran Chand Mukhiya, Marksman of Drawing Section of the ASI.

I would record a word of appreciation for Nadeem Hussain of M/s Nadeem Graphics, and Anil Kochar of Public Printing (Delhi) Service for their efforts in composing the manuscript, designing and printing of this issue.

New Delhi 24.03.2004

(**R.C. Misra)** Director General (I/C)

CONTENTS

INDIAN ARCHAEOLOGY 1998-99-A REVIEW

I. EXPLORATIONS AND EXCAVATIONS

ANDAMAN AND NICOBAR

1. EXPLORATION IN ROSS AND VIPER ISLANDS, DISTRICT ANDAMAN

With a view to ascertaining the importance and documenting the old dilapidated colonial buildings in the Ross and Viper Islands and to trace other archaeological remains, if any, S.B. Ota of the Kolkata Circle of the Archaeological Survey of India[1],assisted by S. Maiti, S.K. Ghosal, A.C. Roy, K. Srimani, S. Sarkar, explored Ross and Viper Islands thoroughly.

Towards the close of the eighteenth century AD, on Andaman Group of Islands, the British Colony was established in South Andaman area. Before that this area was inhabited by the aboriginals. By the 50's of ninteenth century AD, Ross Island grew up as the Headquarters of the Indian Penal settlement. The Island is situated on the entrance to Port Blair from the eastern side in South Andaman. The Island is approximately 0.6 sq km comprising roughly 70 acres of land. It is roughly 1500 yards in length and 650 yards in width. The southwestern side is lower than the rest and it rises to a height of approximately 65 m on the north-east side.

The British settlers with the help of the depostеd rebellions (mostly took part in sepoy Mutiny and in subsequent other sporadic movement) left no stone unturned to furnish the headquarters with all sorts of amenities and facilities and thus many a colonial buildings, structures, church, graveyard, etc. were erected one after another successfully utilising and exploiting the natural contours in the Island.

During the course of exploration altogether remnants of nearly one hundred and twenty-six structures and structural alignments have been found. These are partially documented also. Many of the structures of the Island are associated with the Freedom Movement in India. Some of them are still identifiable. Mostly these are brick-built structures and the ceilings and roofs are of wood and GI Sheets. The growth of thick vegetation as is the case in a tropical area has mostly damaged the buildings. However, some of the important identifiable buildings are: The Gorabotha of British Troop's Barrack, cook house, Chief Commissioner's bungalow, Protestant Church, Printing Press, Bakery, Power house, water distilling plant, Indian soldiers' Barrack, Hindu temple, Assistant Commissioner's House, swimming pool, British Officer's Institute, water tank, Indian Officer's Quarters, Farzand Ali Stone, Graveyard, etc. Majority of the structures located in the northern half of the

[1]Referred to as Survey in the following pages.

Island are comparatively in a better state of preservation. No archaeological relics of earlier aboriginal settlement have been found. Of all the structures special mention may be made of the gigantic Gorabotha or the British Troop's Barrack. It was constructed mostly of stones with regulated use of bricks. This long castle-like structure was built imitating the Windsor Castle in England. It has cross projections at regular intervals and these projected facades appear to be the facades of a Church. The other mentionable structure is that of the Chief Commissioner's Bungalow which is located in the highest terrace of the Island. The brick-built roofless damaged building with a number of cells and connecting passages stands on the eastern side of the terrace. The original wooden double-storeyed structure to the front of this building has completely gone leaving behind a spacious yard paved with coloured tiles and stone slabs. It was one of the beautiful buildings of the Ross Island. Mention may also be made of the Protestant Church built in AD 1862-70. The Church with its bell tower, attached to its northern side, comprises a frontal porch, Prayer Hall, the Registery on its southern side, the Vestry on its northeastern side, the Channel, etc. Buttresses at regular intervals are provided on the outer sides of the Church walls. It has undergone repairs for several times.

One of the most interesting structural remnants of the Ross Island is the Christian graveyard. It was enclosed on all the four sides by the boundary walls. Inside the graveyard there are more than thirty graves and tombs some of which contain epitaphs. This graveyard contains in itself part of the history of the Ross Island.

In the Viper Island also exploration was conducted. Before the colonial settlement this Island was also inhabited by the aboriginals of Andaman. It comprises an area of about 31.19 hectares and is situated 2.25 miles to the north of Chathau Island. This Island was closely connected with the Ross Island so far establishment of penal settlement is concerned. But it became famous for its jail building which was constructed in-between 1864 to 1867.

During the course of exploration it has been observed that the whole area was surrounded by a high boundary wall for protection. These jail buildings were associated with the Freedom struggle of India. In course of exploration, variety of constructional activities have been noticed which include Kacharibari, number of unidentifiable buildings, Gallows, Residence of Jail Super, Parade Ground, Pond, Hospital Building, Stable, Male Jail and Female Jail, etc. Except the Kacharibari all other relics are not in a good state of preservation and some are preserved by only basal platforms. The importance of these remnants lie in the fact that these were mostly constructed by blood and sweat of the convicts/victims who were mostly deported from the main land for taking part in different movements.

BIHAR

2. EXCAVATION AT STUPA MOUND, KESARIYA, DISTRICT EAST CHAMPARAN

In continuation of the last year's work *(Indian Archaeology 1997-98-A Review,* pp. 13-14)[1], the excavation at Kesariya was resumed by Muhammed K.K. of the Patna Circle of the Survey, assisted by D.P. Sinha, K.C. Srivastava, D.N. Sinha, Monoj

[1] This publication is referred to in the following pages by the year only.

Dwivedi, P.K. Tripathi, M.P. Singh, Avinash Kumar, S.K. Arora and Rajnish Kumar Raj. In addition to sixteen unfinished trenches of previous year (1997-98), eighteen new trenches measuring 10 X 10 m in grid pattern, were laid with an objective to expose the stupa further to know the nature and determine the chronology of different phases of the structure.

On the basis of the structure exposed so far, it is clear that the stupa was constructed in five terraces veneered with bricks laid in mud-mortar. The bricks are broadly of two standardized sizes with minor variations, approximately 36 X 21 X 6 cm and 32x 16 X 5 cm representing two phases, Sunga-Kushan and late Gupta period respectively. A third size of bricks measuring 20x10x5 cm represents the phase of repairs carried out during the British period.

The base circle measures over 100 m in diameter and rises in a curvilinear fashion for a minimum of thirty-four courses of bricks, as per the available evidences at two places. But most of the portions are missing due to formation of rain gullies and other agents causing fall of bricks.

A group of nine cells upto third terrace have been fully exposed this year removing baulks and other deposit, the cells are having an average size of 2.20 X 1.80 m with an opening of 70 to 90 cm. Vertical gap between the floors of the lower and next upper terraces for the rise of the cells measures approximately 2.25 m only; the outer face of the cells contain *kumbha-type* mouldings and decorative niches in the characteristic style of Gupta and late Gupta period.

All the cells once contained a large image of Buddha seated in *padmasana* on a brick platform attached to the back wall, although the evidence is available in five cells only. Upper portion of all the images are missing and it is natural under the condition of collapse of structure over the images and their exposure to the weathering agents. The core of the images are made up of clay mixed with brick jelly and lime to which a smooth surface treatment was given. There is evidence of another one inch thick coating of surface treatment over the image during a subsequent period. The platforms of the cells were plastered but removal of plaster in two cells have exposed two sets of small side niches on the platforms. One set is empty while the other contains lion figures in the niches which are assignable to late Gupta period on stylistic consideration.

A large number of decorative bricks, brick tiles, *kirttimukhas,* two beads, one dabber, one Islamic coin, copper bangles and an arrow-head have been recovered during the excavations. Pottery is only red ware which includes miniature pots meant for performing rituals, pot-cum-lids, spouts, stamped pottery, sprinkler heads, some fragments of thick jars, bowls and vases etc.

3. Excavation at Kolhua, District Muzaffarpur

In continuation of the previous year's *(1997-98,* p. 15) work, Muhammed K.K. of the Patna Circle of the Survey, assisted by D.P. Sinha, Manoj Dwivedi, Ashok Kumar Gupta, Avinash Kumar, and S.K. Arora resumed excavation at Kolhua. Area in-between the *svastika-* shaped monastery and the tank was taken up this year which revealed a connecting pathway between the two, made of rammed floor of brick jelly in *lime-surkhi* mortar. Steps of the entrance gate of the monastery made of bricks on edge were also exposed.

A strip of 10 X 40 m to the north of the excavated remains was also taken up which revealed the remains

of a number of votive stupas and a rammed plastered floor, made of brick jelly, lime and *surkhi,* with a slope towards the tank. The excavation yielded some decorative bricks, terracotta beads and sling balls, finial portion of miniature stupas, and red ware potsherds, all datable to Gupta and late Gupta period.

4. Exploration in District Saran

Along with the Conservation Officer, Sahdeo Kumar of the Directorate of Archaeology, the Government of Bihar, Patna, Sanjeev Ranjan found in the course of exploration, the remains of boundary wall of a big fort, remains of temples and Samadhi by the side of the River Mahi. There are two temples in the Chiraiya Math, out of which one possesses foot prints of Lord Vishnu and the other has images of Siva and Parvati in standing posture. There are many *Siva-lingas* around this temple. It appears to be a Saivite Matha and belongs to the tenth-eleventh century.

There is a temple of Kali, situated on the confluence of two Rivers Ganga and Mahi with ancient images and sculputured fragments, Bhadrakali and the part of the railing which are very important. The railing is comparable to the railing of Bodhgaya. This is also assigned to the Sunga period.

Also found nearby are the images of Vishnu and Uma-Mahesvara.

In the temple of Vishnu, there is an image of Garuda, belonging to the eighth-ninth century.

In the temple of Uma-Mahesvara, there is an image of Uma-Mahesvara.

A four-handed image of Vishnu in standing posture was found installed in the sanctum of the famous Harihara Temple. There is a *Siva-linga* in front of this temple.

5. Excavation at St. Augustine Church, Old Goa, District North Goa

In continuation of the previous year's work *(1997-98,* pp. 18-19), excavation and conservation were carried out under the guidance of J. V.P. Rao, assisted by Manoj Saxena, G.K. Korgaonkar, and V. Gopala Rao of the Mini Circle Goa, of the Survey. During the year, the area taken up for excavation was right wing of the convent area where a hall was exposed with seating arrangements on either side. The excavated area measures about 12.6 m X 7.45 m X 3 m.

The floor of the hall is lime-plastered with a long stone bench on either side of the nave. Besides there are separate stone seats built in the wall, perhaps for prayer. This kind of arrangement could be seen in other living monuments but made of wooden seats where the monks of the convent used to come for daily prayers. This arrangement in the unearthed area reveals that this must be a chapel within the convent for monks for individual payers.

A circular stone was found fixed *in situ* on the floor having a radius of 15 cm. This might be a place where they used to keep some sculptures on a pedestal/stand -like thing. Antiquities comprised a brick with label inscription reading "inri", two coins of Protuguese time, Chinese Celadon ware and tiles of different colours.

GUJARAT

6. EXPLORATION IN HALOL TALUK, DISTRICT, GODHRA (PANCHMAHALS)

In the course of village-to-village survey, Vilash D. Jadhav of the Vadodara Circle of the Survey, reported the following sites of archaeological interest.

Village	*Nature of remains*
Abheta	Miniature temple of medieval period with stone sculptures of Ganesa, Parvati and Mahishasuramardini
Etavadi	Two hero-stones of late medieval period
Jambudi	Structural remains of medieval period
Lakhariya	Sturctural remains of medieval period
Mahudi	Structural remains of medieval period
Masvad	Stone sculptures of Siva and Ganesa, datable to *c.* fifteenth century
Tajpura	Microlithic tools
Tarkhanda	Remains of medieval Siva Temple containing broken images of Siva, Parvati and Nandi
Varsada	Four hero-stones of late medieval period

7. EXPLORATION IN VANTHALI TALUK, DISTRICT JUNAGADH

Ramesh Kumar Singh of the Vadodara Circle of the Survey, brought to light the following antiquarian remains during the course of village-to-village survey.

Village	*Nature of remains*
Dhandhusar	Siva Temple datable to *c.* twelveth/thirteenth century; two temples (Shri Tileshvara Mahadeva and Kua Fariya dedicated to Lord Siva datable to *c.* sixteenth - seventeenth century; fortification with three gates
Koyali	Trinetresvara Mahadeva Temple, *c.* sixteenth - seventeenth century
Shapur	Devariya Mahadeva Temple datable to *c.* sixteenth-seventeenth century; Jagannatha Mahadeva Temple of medieval period, mosque and Begam Mahal; remains of fortification walls, gates *c.* eihteenth-ninteenth century

8. EXCAVATION AT DHOLAVIRA, DISTRICT KACHCHH

Under the direction of R.S. Bisht of the Survey assisted by R.S. Fonia, K.C. Nauriyal, Y.S. Rawat, Bhuvan Vikram, V.H. Paramar, N.B. Soni, J.B. Makwana, Ravinder Kumar, Baldev Singh, K.R. Malviya, Sanjay Kumar, Subhash Chand and D.R Modi resumed excavation at Dholavira. The objectives of this season's work were: to ascertain the length of Stadium located in-between 'Citadel' and 'Middle-town'; to expose the possible gate at the southwestern corner of Citadel connecting Bailey with the area of the rock-cut reservoir; to expose the western end of the rock-cut reservoir; to open more area of both the water reservoirs; to open the possible entry to the smaller Stadium from southern side, and to expose the eastern arm of the Stage - VI fortification at its north-east corner. The present work, besides fulfilling the archaeological objectives, was also aimed at facilitating the requirement for the development plan of the site.

The excavation work was carried out in all the trenches laid for realizing the above-mentioned objectives for the current season. Besides, cleaning operation in the previously excavated trenches in all three divisions of the Harappan city of Dholavira was completed. The excavation has brought to light the following results.

In order to know the exact length of the stadium and the nature of the structures at its western end a long north-south trench, falling in Squares 66x36, 66 X 37,66 X 38,66 X 39 and 66 X 40,67 X 31,67 X 32, was laid. This trench was extended towards west at it's southern end in trenches 67 X 41 and 67 X 42 in order to expose a possible gate-complex. In these trenches a large building-complex with broad outer wall and a massive covered drain have been exposed partially. The remains of building activities have been noticed on the un-exposed surface of the mound towards further north of it's exposed southeastern corner. The outer walls of this structure are 152 cm thick while the partition wall ranges from 56 cm to 106 cm in thickness. The largest room space so far noticed measures 465 X 333 cm. This structure lies at 9.90 m north of the northern arm of the Bailey's wall with six courses and the extant height available in the excavated trench is 1.15 m.

In the open space between the Bailey's fortification and the large building-complex, a massive covered drain running in east-west direction has been exposed at the depth of 1.45 m below surface. The drain has been exposed for a length of 1.30 m while the width measured 1.15m with height of 152 cm under the capstone. In this exposed length, a manhole measuring 115 X 70 cm has also been noticed.

Another interesting feature exposed in these trenches is a 44.85 m long raised platform (?), which is projected about 2.80 m from the north-south oriented 1.52 m thick outer wall of the large structure. This projected feature seems to be attached to the western end of the long stadium. Now, the available length of the stadium measures 283.45 m. A 2.75 m wide and 7 m deep passage has also been brought to light near the northern end of this projection. At present, this entrance seems to have been provided through the defensive wall of Stage VI at the site. Also recovered from the area are a few fragments of two free standing pillars of limestone.

The western end of the rock-reservoir lying to the south of Citadel was also exposed completely in trenches 58 X 18 X 34 and 58 X 19. Interestingly, the bed rock at the end was left undressed hence undulating as it was originally. Obviously, the Harappan did not like to tamper with the natural character of the rock at the lower gradient and near the spill channel where

the water thrust should have been the heaviest. NE corner of the reservior has been noticed at 1.15 m below the present surface. The breadth of the reservoir at this end measures 10.80 m and 11.40 m at different levels from bottom-to-top respectively. The depth also varies from north-to-south, i.e., 1.95 m to 4 m. The length of the northern embankment of the reservoir exposed near the NW corner measures 4.25 m above the rock. With this, the total length of reservoir now has been confirmed to 95.00 m.

The previous year's trenches 48x38, 48x39, 48 X 49 wherein the central part of the rock-cut reservoir was exposed were also operated in order to remove the earth which collapsed from the standing sections of the previous excavation. Besides, the reservoir was also exposed more lengthwise towards the east as well as the west. Now the exposed length in these trenches admeasured 13.25 m from the previous length of 9.50 m.

In the Annexure area, the trenches 59 X 22 and 59 X 23 were partially excavated and in both the natural rock was reached. In this part of the site the bed-rock lies at the depth of 3.80m to 4m from the mounded surface of the site. In the trench 59 X 22 X 2, three successive phases of raising of a north-south oriented fortification wall have been brought to light. The earliest wall, built partly of the rubble and mud-bricks was found raised on a flimsy deposit overlying the 1 m thick fossil sand-dune formation. The wall was tastefully plastered with fine white clay. The succeeding walls were built with only mud-bricks and were also plastered with colourful clay. A thin rubble wall also found running NS parallel to the fortification wall at a distance of 2.30 m east. It has been observed that along the wall a pathway was running which was also being raised with the rise of the fortification wall and the thin wall perhaps serving as a retaining wall of the pathway.

Trenches 58 X 23, 58 X 24, 58 X 25, 58 x 32, 58 X 33, 58 X 35 and 58 X 36 falling in the zone where the outer southwestern corner of the Castle wall meets the southeastern corner of the bailey wall were subjected to excavation at varying depths. The western wall face was exposed to a length of about 18.00 m from the corner point in the south. The extant stone veneer of the wall has been exposed upto a height of 5.10 m. The southern wall was also exposed upto 12.00 m from the same corner eastward with a height of 2.75 m. So far eighteen stone courses have been exposed. At juncture of the walls of Bailey there was laid bare a narrow passage from east-to-west for giving access to the latter. This exposed passage is provided with three improvised stone steps from the east. Stratigraphically, these steps belong to the last phases of occupation at the site.

The area to the east of Citadel was taken up for excavation. The old trenches covering part of the eastern reservoir were extended towards south as well as upto the Citadel wall in the west. In the trenches 37 X 74, 37 X 75 and 37 X 85, there was found a pathway running along the perimeter walls as found earlier, of castles as well the smaller stadium confirmed at juncture of those two walls there was laid bear a 1.56 m wide gate giving access to the latter.

Besides the above work, the whole site was cleaned afresh and the Vadodara Circle of the Survey, carried out conservation work in the middle town area.

9. EXPLORATION IN BHILODA TALUK, DISTRICT SABARKANTHA

Vilas D. Jadhav and S.S. Parekh of the Vadodara Circle of the Survey, explored and reported the following antiquarian remains.

Village	*Nature of remains*
Asal	Late medieval site, containing remains of Brahmanical temple and loose stone sculptures
Bhatisoda	Deserted village site of late medieval period
Kheracha	Early medieval temple with images of Siva, Parvati and Mahishasuramardini and medieval pottery
Khodamba	Remains of Siva Temple datable to *c.* fourteenth century; sculptures of Kubera, Ganesa and Bhairava
Sardoi	Three temples of Hindu pantheon of medieval period

HARYANA

10. EXPLORATION IN DISTRICT BHIWANI

Manmohan Kumar, of the Department of History, M.D. University, Rohtak, along with Rajeev Joon, conducted explorations in Dadri Block No. 2 of the district and thirty-nine new sites ranging from pre Harappan to the medieval period were discovered. The details of the survey are as under.

Adampur Dradhi (76°13'E; 25°32'N)	Early historic red ware
Assawari (78° 08' 30" E; 28° 32' 30" N)	Early historic and early medieval red ware
Balali (76° 10'E; 30° 01'N)	Medieval
Barsana (76° 07' E; 28° 35' N)	Late Harappan
Bijana (76° 09' E ; 28° 27' 30" N)	Medieval ware
Birhi Kalan (76° 09' E ; 28° 36' N)	Early historic and medieval

Village	*Nature of remains*
Chanani (76° 07' 30" E ; 28° 28' N)	Medieval
Charkhi (76° 08[1] E ; 28° 37' N)	Early historic and medieval
Chhappar-I (76° 07'30" E& 28° 38'N)	Early historic and medieval
Chhappar-II (76° 07' 30" E ; 28° 38' N)	Medieval
Chidiya (76° 15' 30" E; 28° 27' 30" N)	Medieval
Dadhibana-I (76° 12' E; 28° 31' 30" N)	Late Harappan, PGW, early historic and medieval
Dadhibana-II (76° 12'E; 28° 31'30")	Early medieval
Dadhichillar (76° 13'30" E; 28° 31'N)	Medieval ware
Datoli (76° 14' E ; 28° 27' N)	Medieval ware
Dhikara (76° 15'E and 28° 40'37" N)	Early historic and medieval
Dohoki . (76° 10" E; 28° 40' N)	Pre-Harappan, mature and late Harappan wares
Dudhwa (76° 14' E ; 28° 29' N)	Early medieval ware and coins of Balban
Jawa (76° 09' 30" E ; 28° 28' N)	Medieval

Village	Nature of remains
Jhojhu Kalan (76° 09'E; 28° 31'N)	Medieval
Kalali (76°ll'E;28°31'30"N)	Late Harappan and early historic ware
Kalyana-I (76° 13'E; 28° 32'N)	Early historic ware
Kalyana-II (76° 13'E; 28° 32'N)	Early historic ware and medieval
Mahera (76° 09' 30" E ; 28° 34' N)	Early medieval and medieval
Mondola (76° 12'30" E; 28° 03'30" N)	Medieval
Mandoli-I (76° 13'E; 28° 32'N)	Medieval
Mandoli-H (76° 13'E; 28° 32'N)	Late Harappan and early historic ware
Mankawash (76° 11'E; 28° 37'30" N)	Early historic ware and medieval
Narangwas Jatan (76° 04' E ; 28° 35" N)	Medieval
Narangwas Rajputan (76° 06' E ; 28° 26' N)	Early medieval, medieval ware and coins of Akbar
Patawas Kalan (76° 12' E; 28° 38' N)	Medieval red and grey ware
Patawas Khurd (76°H'30"E;28°40'N)	Early medieval

Village	*Nature of remains*
Rasiwas-I (76° 08' E ; 28° 38' N)	Medieval
Rasiwas-II (76° 08' E ; 28° 38' N)	Mature Harappan, Late Harappan and medieval
Sahuwas-I (76° 13'30" E; 28° 38'N)	Early historic and medieval coins of Yaudheya, Kushan and Sultanate kings
Sahuwas-II (76° 13'30" E; 28° 38'N)	Medieval red ware and coins of Sher Shah Suri
Sarangpur (76° 04' E ; 28° 39' 30" N)	Medieval
Tiwala-I (76° 08' E ; 28° 29' N)	Early historic and early medieval
Tiwala-II (76° 08' E ; 28° 29" N)	Medieval

11. EXCAVATION AT KUNAL, DISTRICT FATEHABAD

In continuation of the earlier work *(1995-96,* pp. 24-25), J.S. Khatri of the Department of Archaeology and Museums, Government of Haryana, assisted by Kali Ram, R.S Dahiya, Anand Prakash Jangra and Darbar Singh resumed excavation at Kunal (29° 30' N; 75° 41' E) with the following objectives to check the outer limit of Early Harappan settlement at the site; to extend the archaeological operation towards north-west and south-west of the site as also to corelate the inner remains with the outer remains; to know the details of PGW cultural remains and Bara cultural remains on the outer periphery of the mound.

Preliminary results of the recent excavation are highly significant to open a new vista on a wide range both pertaining to cultural and technological issue.

The new discoveries made at Kunal show that before the emergence of Indus Civilization, the plains of the Sarasvati-Drisadvati (Ghaggar Valley) were inhabited by the people as early as fourth millennium BC who would have been the direct ancestors of Mature Harappan people. The excavation at Kunal unveiled evidences of the process of change which led to the formation of the Harappan Civilization. The discovery of certain unique items of regalia of the early Harappan culture found so far for the first time, has added a new dimension to the Indian proto-history. The discovery of steatite button seal during this year's

excavation, exhibit its ancestry to the Rehman-Dheri (Baluchistan) examples. To obtain this year's objectives, following trenches were laid out for excavation.

Trench No	*Qd No*	*Total Layers*	*Total depth below surface*
XB3	IV	*1*	1.25 m
XC3	I	7	1.32 m
XC3	I I	13	2.90 m
XC3	I I I	13	2.32 m
XC3	IV	7	1.10m
XD3	I	10	1.75 m
XD3	I I	8	57 cm
XD3	I I I	8	28 cm
XD3	IV	8	60 cm
XE3	I	9	76 cm
XE3	IV	9	35 cm

In addition to the above, last season's partially excavated Trenches WA 2, WA3, XA 3, XB 3, XC 3 Qds II and III have also been taken up for excavation. The round house previously encountered in Trench WA 3 Qd IV and I have been completely exposed, in which a small gold bead was found. Two oval-shaped ovens were found near the house over the artificially raised ground level with the brown clay mixed with the white nodules. This was done probably to protect their settlements from flood from the river side. Refuse pits were also found adjoining the round house. These evidences belong to the first structural phase. Probably a living pit in Trench XD3 was also encountered. This pit was sealed by layers 10 and dug by the layers 11, 12, 13 and 14, while layers 11-13 are semi-natural and layer 14 is composed of natural soil. It has been dug upto the depth of about 2 m and having the dia of about 3.5 m. The floor has been made with fine clay mixed with cow-dung, which indicate that this must have been the largest living pit excavated so far. Large quantity of painted pottery, bone objects, antiquities and refused bones were found from this pit.

East-west oriented mud-brick rectangular structures have also been found in the mid level. The brick sizes of these structures do not fall in the traditional Pre-Harappan and Harappan brick ratio. During the course of excavation in X-Area on the south-west slope of the mound, the copper furnaces with smelting material have been found. Apart from this, furnaces traced last year were also exposed with a view to obtain samples. Few copper ingots and slags were also found.

The antiquities found during the course of excavation are double-tanged copper arrow-head, rods, rings, bangle pieces, bone points and blades, beads of terracotta, steatite, lapis lazuli, agate, carnelian, faience, terracotta objects such as net-sinker, balls, bangles, animal figurines, wheels, toy cart frames, disc and toys, stone-balls and sharpeners; shell bangles and ring pieces. The most important antiquities of this year include a steatite round button seal containing two deer on one side and geometrical pattern on the other which is comparable to the specimen from Rehman-Dheri (Baluchistan) datable to 4000 BC.

A large quantity of pottery have been found, mainly wheel-turned, bichrome, polychrome and grey ware with geometric and natural motifs and graffiti marks with some affinity with the early pottery of the Gomal Valley in Baluchistan. All these evidences indicate that the early Harappans were practising agriculture, domestication of animals and trade.

12. Excavation at Rakhigarhi, District Hissar

In continuation of the previous year's work (*1997-98,* pp. 55-63), the Institute of Archaeology of the Survey, under the direction of Amarendra Nath assisted by Alok Tripathi, M.P. Jain, R.S. Rana, L.S. Mamani, R.K. Dalai, Ram ji Chaudhary, Umesh Kumar, R.K. Manik, P.S. Rawat, A.K. Jain, Manbir Singh and Madan Lal resumed excavation at Rakhigarhi. Apart from the purpose of training to the PGDA students in field archaeology, further excavation at the site was taken up with a view to ascertain the stratigraphical positions of Early, Mature and Late Harappan periods as reported earlier in the course of exploration. However, the field season of 1997-98 could only reveal the cultural horizon of Mature Harappans. The other objectives were to lay bare more areas of the Harappan settlements in RGR-1 and RGR-2 and continue investigation of the fortification around the settlement.

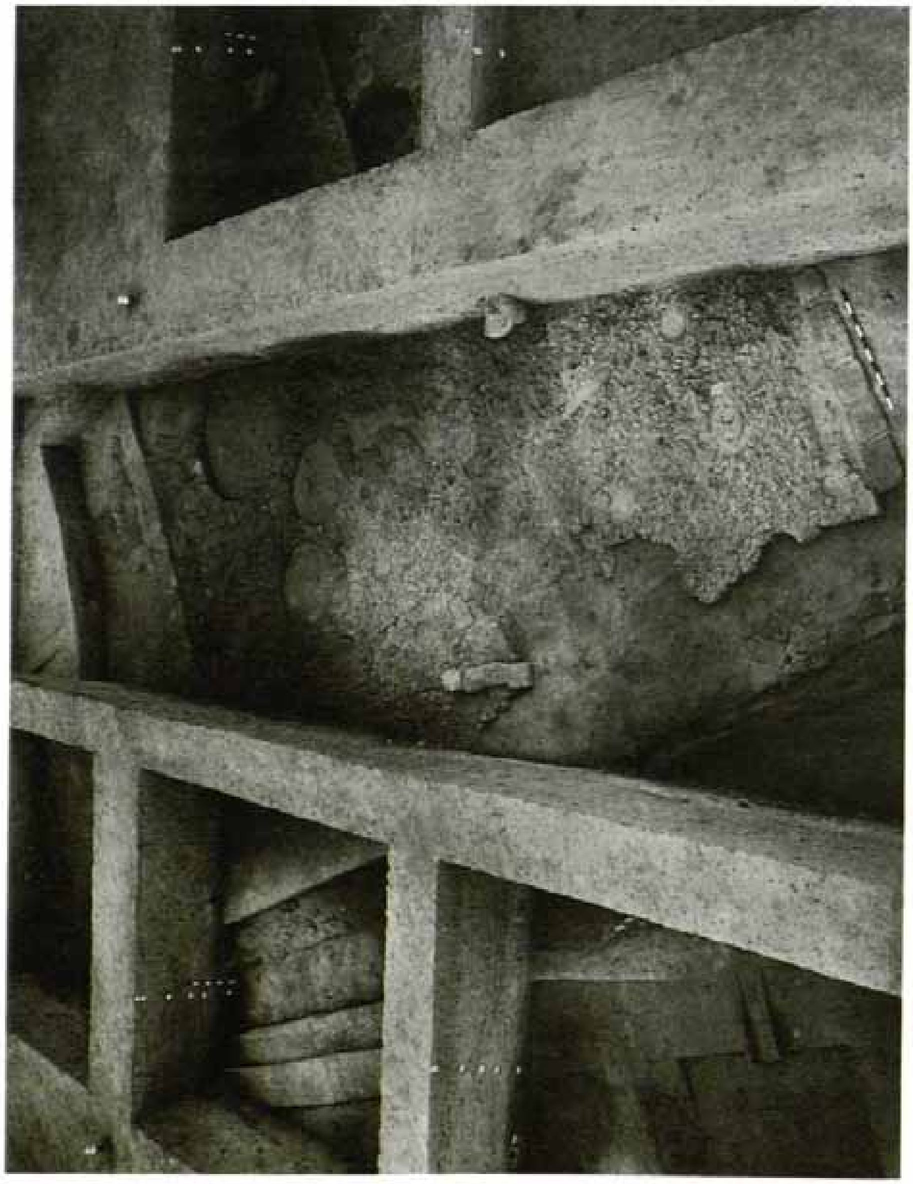
In order to achieve the above objectives, trenches were laid judiciously adjacent to the previous year's cuttings at RGR-1 and RGR-2. Accordingly a series of trenches in the west-to-east direction were laid in RGR-1, namely, H-5 to N-5. The eastern extent of habitation could be determined by opening Trench Y-5 while the western in A-5, likewise, the northern extent of the habitation could be determined in ZF-1 while southern in N-13. In RGR-2, the southern portion of the mound, was subjected to excavation. The trenches, contiguous to the last year's excavations, opened were M-19, Q-18 to Q-20, R-18 to R-20, S-18 to S-20, and further in the south-eastern margin were Y-24 to Y-26, Z-23 to Z-26. On the northern slope of RGR-4, D-4 was opened with a view to understand the extent and nature of deposit in this part of the habitation.

As against the first season's sequence of culture, the current excavations at Rakhigarhi revealed the cultural horizons of Early Harappan (Period-I) succeeded by Mature Harappan (Period-II). The absence of Late Harappan deposits remained to be explained.

Period-I designated as Early Harappan was noticed in the cutting N-10 and N-11 in the southern slope of RGR-1 (pl. 1). Relatively limited evidence of this period was encountered in W-5 and X-5 on the eastern margin of RGR-1. Similarly test pits ZF-1 and A-5 also revealed Early Harappan occupational levels, respectively on northern and western margins of the mound. The exercise of digging on the periphery of RGR-1 could determine the extent of Early Harappan occupation extending in an area over 4.5 hectares. The deposit, nearly two and a half metre thick, shows the beginning of occupation over the alluvium. The extensive use of kiln-fired bricks in addition to sun dried was unique to this site. Some of the burnt-bricks bore pre-firing mason marks; some are reminiscent to the Harappan characters.

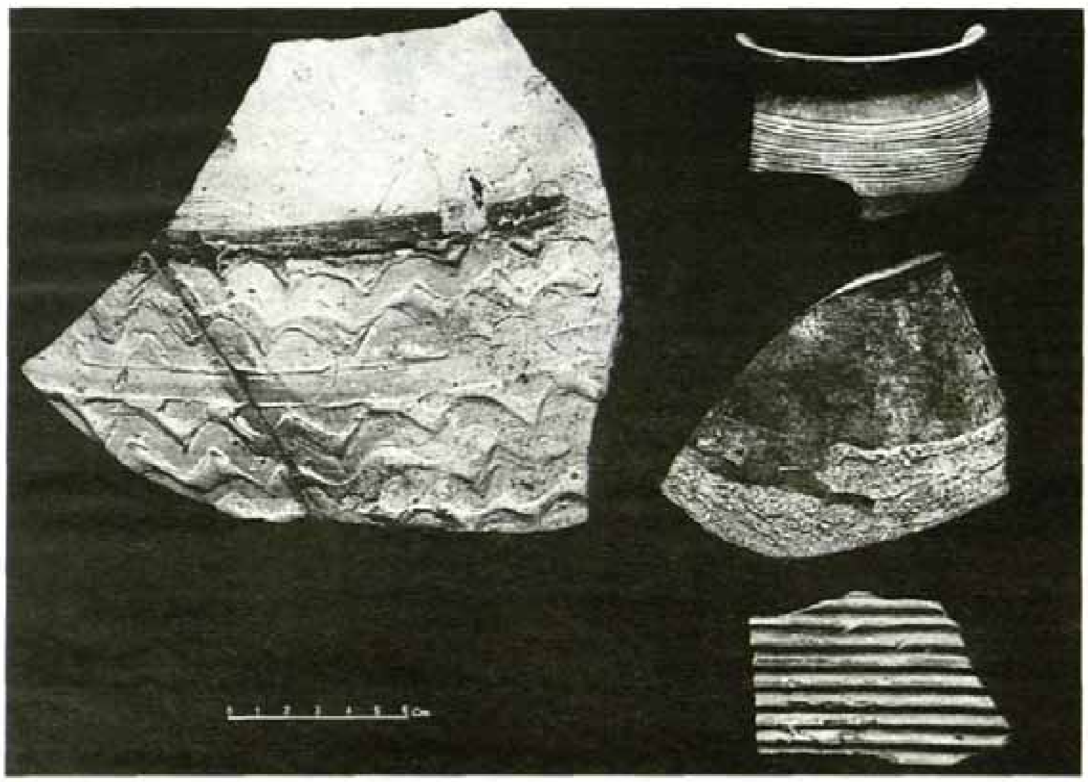
There were three structural phases out of which phase-2 could be studied in greater detail. It revealed the beginning of planned settlement showing north-south running public drainage system with a slope towards south and a house drain joining it besides houses aligning on either side of the former. The arms of the drain were of burnt-bricks, while its base was unpaved. A burnt-brickbat paved courtyard flanked by verandah was noticed on the eastern side with a slope towards the public drain. There were two sets of circular pits cut in the floor, two of bigger diameters were aligned north-south, while the smaller two were aligned east-west. There were a few post-holes around these pits. Over this floor, two kilns filled with ash and bits of charcoal, were noticed. Its chambers

Plate 1



Rakhigarhi : general view of structural remains

Plate 2



Rakhigarhi : Early Harappan pottery of Hakra affinity, Period -I

were made of lower portions of jars, internally mud lined. Next to these kilns was reported a saddle quern. In addition to these evidences, the floor also revealed weeds *of bathua* possibly used in preparing colour. The courtyard seems to have been used either for thrashing grains or for dyeing.

The pottery types were essentially wheel-made with a few exceptions of hand-made specimens. It was relatively light and thin in fabric, red to pinkish in colour and painted in black, combined at times with white, over a self-slipped dull surface. The combination of black and white considerably increased the design-effect. The potters chose to paint the neck and shoulders. The design elements were essentially geometric. The simplest among them included horizontal bands, row of dots, latticed traingles, fish-scales, etc. Motifs used as filler were radiating lines ending in solid disks, four-petalled flowers, *peepal* leaf and circle with radiating arches. Important shapes include jar with an out-turned rim, basin and dish-on-stand. A miniature vase-on-stand was reminiscent to the one reported from Kalibangan. Apart from red ware, the site had yielded both plain and painted variety of grey ware. The design elements were more or less same as noted above. There were also noticed pottery types of Sothi origin, which are presently termed as Hakra wares (pl. 2). The types noticed were incised, applique, rusticated/dendritic and ribbed or striated. The incised ware characterized by thick and thin medium-sized vase was decorated externally with groups of multiple incised lines drawn horizontally, diagonally and in wavy compositions. Applique red ware characterized by thick applique zig-zag bands occurring over big jars had pronounced out-curved rim. The dendritic ware of medium fabric revealed shapes in medium-sized vases. It was first painted from neck to shoulder and subsequently treated with secondary coating of mud mixed with coarse particles. The paste is generally seen overlapping the chocolate slip applied over the out turned rim, neck and shoulder portion of a pot. The ribbed ware was both in thick and thin fabrics, the shape however, could not be determined.

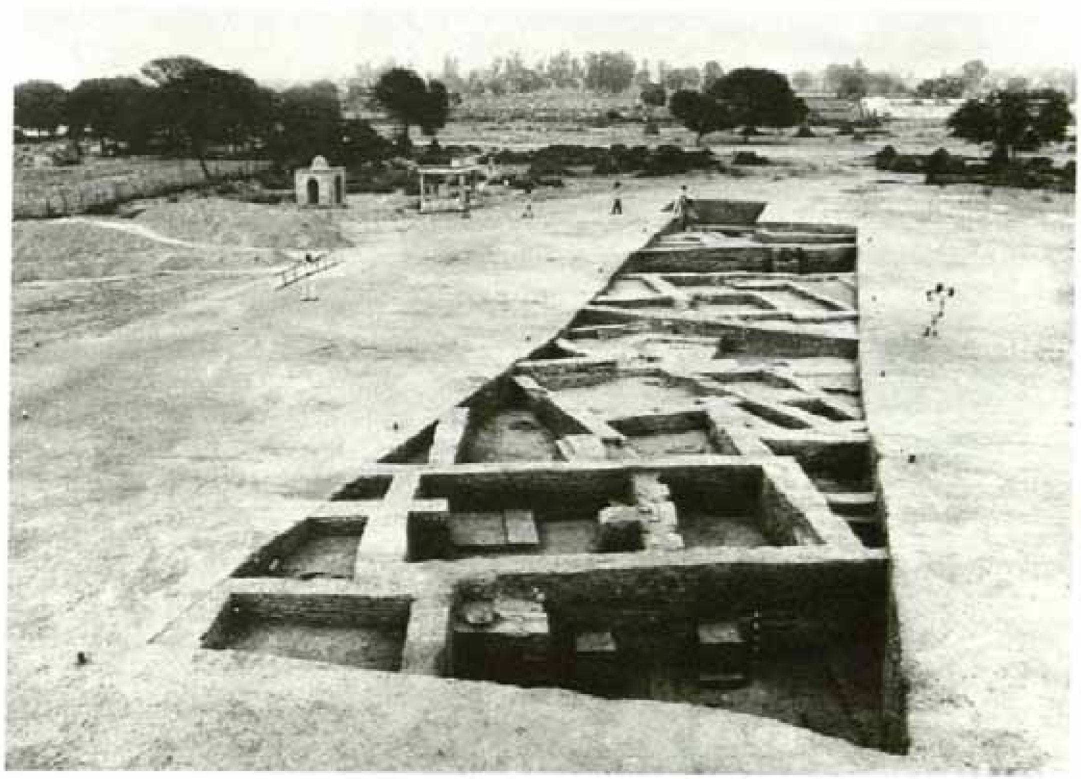
Copper objects reported from this horizon, were arrow-heads, needle and bangles. The lithic industry was represented by chert blades and a fluted core. Among the terracotta finds segmented bangles, animal figurines, toycart frames deserve mention. Other important antiquities were beads of semiprecious stones, steatite, faience and sling balls.

The Early Harappan graffiti marks include auspicious signs like *svastika,* unending knots and abstract signs, some are akin to Harappan characters arranged in a row, indicating beginning of writing. On the contrary, a few uninscribed terracotta seals have also been reported.

Period - II confirmed the cultural components of Mature Harappan period reported during the previous year's cuttings in RGR-1 (pl. 3) and RGR-2 (Citadel mound). A mud-brick podium with a porch in front oriented east-west, was noticed in the central part of Citadel mound (pl.4). The podium consisted of a couple of in-built rectangular pits and segmented fire-altars with four chambers, one of them had a stump of brick in the centre (pl.5). The inbuilt pits contained fresh bones of bovine animals, ash, bits of charcoal and dish fragments. Thus these evidences indicate fire and animal-sacrifice, rituals performed over the podium. The podium had streets on all the four sides while the northwestern corner had a brick well complimenting the function of the former.

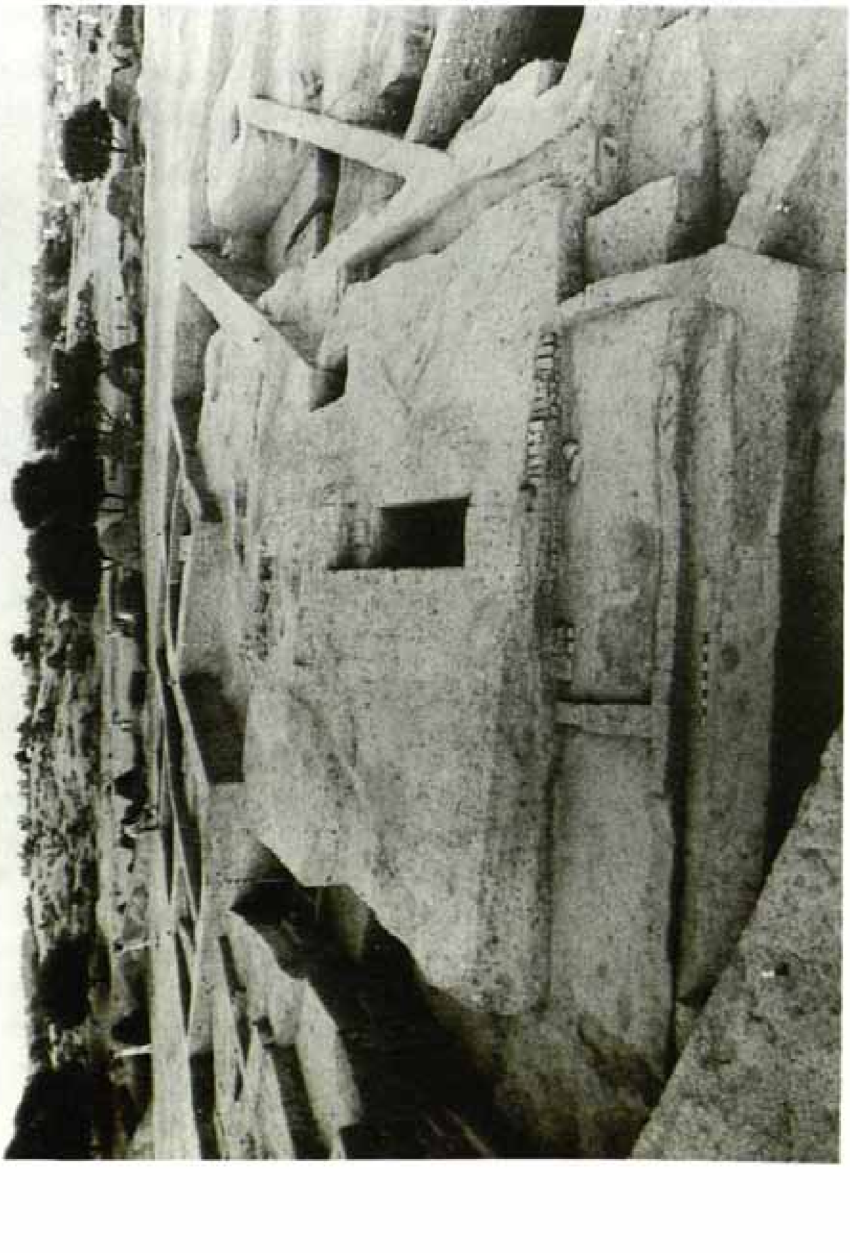
A couple of fire-altars of distinct type were also noticed from RGR-1. In K-5, a fire-altar of human form *(chitti* type) with extended arms (pl.6) was

Plate 3



Rakhigarhi : general view of the excavated trenches, RGR-1, Period-II

Plate 4

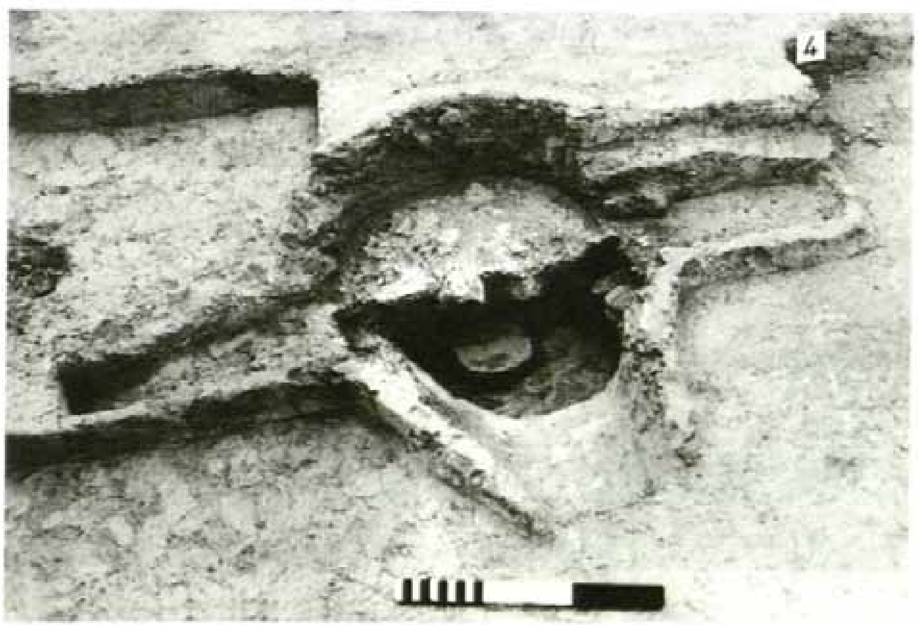


Rakhigarhi : general view of the podium with a porch in front, RGR-2, Period-II

Plates 5-6



5



6

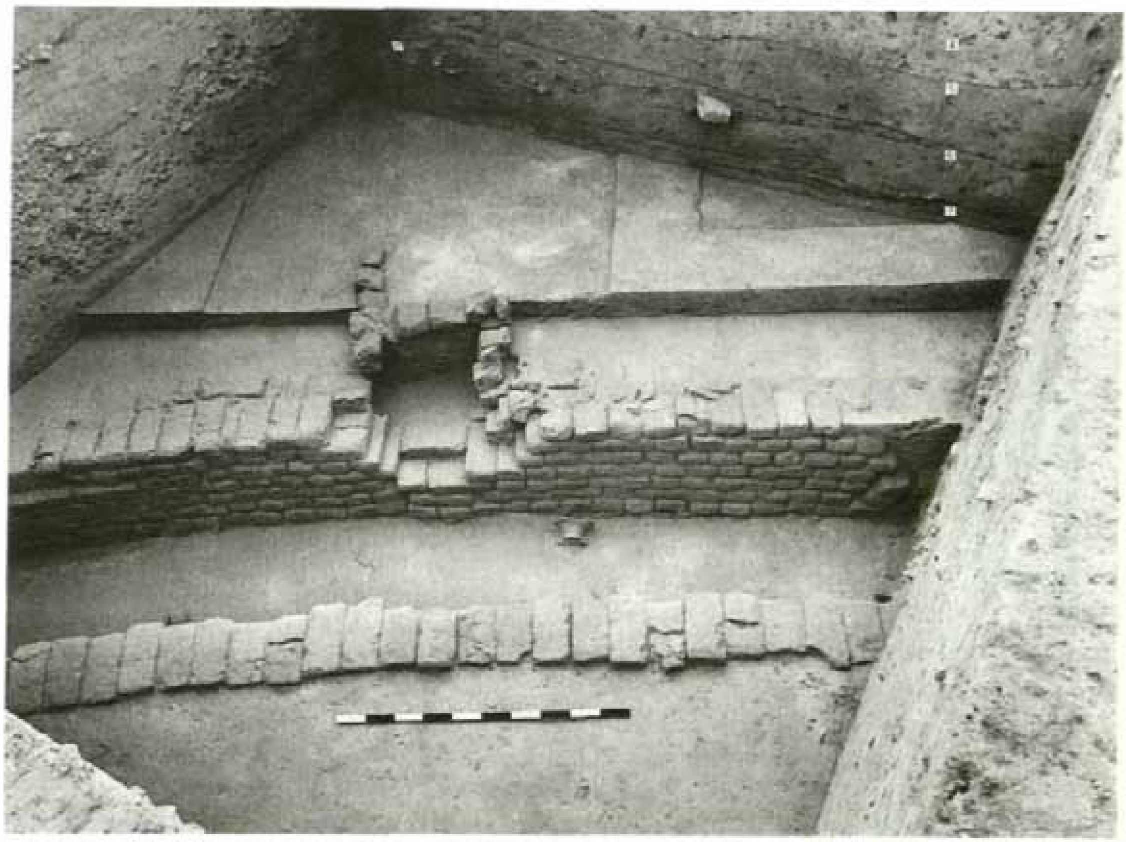
Rakhigarhi : 5, four-chambered fire-altar over the podium, RGR2, Period-II, 6, view of chitti-type fire-altar, RGR-I, Period-II

Plate 7



Rakhigarhi : view of yonipitha type fire-altar, RGR-1, Period-II

Plate 8



Rakhigarhi : general view of public drainage system, RGR-2, Period-II

Plate 9



Rakhigarhi : view of potter's kiln, RGR-1, Period II

noticed with a stump-like projection in the belly portion. In H-5, fire- altar of *yonipitha* a type (pl. 7) with a stump-like projection in the centre was noticed.

The evidence of public drainage system and household drains invariably show use of burnt-bricks (pl.8), its bases are largely unpaved with some exception. Some house drains were terminating in the street, while a few in the soakage-jar.

A potter's kiln was noticed in RGR-1, N-5 (pl.9). It was conch-shaped on plan oriented in east-west direction. The belly portion had couple of inbuilt shafts for supporting the pots and regulating fire. The interior wall of the kiln was plastered with clay and rice husks.

The pottery types were identical to those reported last year. Among the important antiquities, terracotta bulls, water buffaloes, dogs, lions, leopard, rabbits and birds etc. besides cart frames, sling balls, bangles deserve mention. As compared to animal figurines, the numbers of human figurines unearthed were meagre. Other finds include chert blades, weights, copper objects, gamesman, beads etc., besides steatite seals and terracotta sealings and clay tablets. An inscribed lead ingot of plano-convex shape was another important discovery.

The results of the excavation confirmed the Early Harappan occupation, succeeded by the Mature Harappan. However, the stratigraphical horizon of the Late Harappan occupation remains to be explored.

13. Excavation at Sugh, District Yamuna Nagar

The ancient site of Sugh (Amadalpur-30 9*N and 77° 23'E) situated about 5 km east of Jagadhri, the tehsil head quarter, enjoyed a considerable importance during the ancient times when it was known as Srughna. Earliest reference to this place as Turghna is mentioned in the *Taittiriya Aranyaka*. The city ranks high in importance in the *Mahabharata* when it is mentioned along with the famous cities of Ahichchhatra and Hastinapura. The road from Mathura to this town has been mentioned by Varahamihira and the Buddhist texts like *Mahamayuri* and *Divyavadana*. Chinese pilgrim Hiuen Tsang found an Asokan pillar and a monastery here in the seventh century AD. Thereafter till about the twelveth century it remained an important place probably because of its ideal location on east-west trade route.

In the background of the above mentioned literary evidences, the archaeological excavation work was jointly conducted by D.S. Malik and M. Acharya, assisted by Ranavir, R.L. Verma, A.K. Jindal, V.P. Singh, V.K. Gupta and Darbar Singh of the Department of Archaeology and Museums, Haryana. Besides imparting field training to the students of M.A. (Ancient History and Archaeology) of M.D. University, Rohtak, the specific objective of the present excavation was to determine the cultural sequence of the site; to co-relate the literary evidences with archaeological finds as also to bring into light the socio-economic conditions of different cultural periods.

This year for the first time, proper excavation work was started. But prior to this season, only a few trial-trenches were taken up for excavation during the year 1993-94 and 1995-96. In all nine trenches (NA-1, NB-1, XQ-1, XP-2, XO-4, WR-3, WR-4, WQ-3) which were excavated to a depth ranging from 1 m to 4 m revealed fourfold cultural sequence. Only three Trenches XO-4, NA-1, NB-1 were dug to the natural soil made of yellowish-brown silt. The excavated cultural

deposits are divided into four different periods on the basis of their distinguished characteristics including that of pottery, terracotta objects and other contemporary material. Main features of these cultural periods are as under.

Period I (8OO-5OOBC) characterized by the occurrence of the Painted Grey Ware (PGW), a distinguished class of deluxe pottery which is associated with the *Mahabharata* period, though this pottery is extremely rare at this site. Two ring-wells, consist of a few rings placed one above the other and at another set, three storage-jars placed on the same pattern were also found from this level.

The cultural deposit of Period II (500-100 BC) was constituted by greyish ash mixed with earth with a large number of potsherds on the upper surface. It is characterized by the occurrence of a variety of pottery including that of plain grey ware, black-slipped ware and black polished ware. This cultural assemblage is associated with the Northern Black Polished Ware (NBPW) culture of Gangetic Valley. A few sherds of this pottery in steel grey and black colours have also been found from the site. The pottery shapes like convex-sided dishes, bowls, carinated *handi,* etc., of NBPW are found in other associated wares. The pottery of this period is basically of coarse fabric. No structural remains has so far been found. The notable antiquities of this period were hand-made terracotta animal and human figurines, beads of semiprecious stones, glass and terracotta besides a few copper objects.

At the site Period III (100BC- AD 300) is well known for collection of fascinating and beautiful terracotta art. This period is also marked by the disappearance of NBPW and its associated wares. The occurrence of the early historic red wares, stamped pottery along with terracotta figurines comprise the characteristic feature of this period. The houses are made of sun-dried mud-bricks and burnt-bricks with a size of 36 X 23 X 8 cm. A large number of terracotta objects including that of human and animal figurines, moulded as well as hand-made, have been recovered. Moulded female figurines with heavy ornamentation, transparent drapery in shallow relief belonging to the Sunga art tradition are notable finds. An interesting plaque, with upper portion missing, depicts a child learning the alphabets on a wooden plate was also found from this level. Kushan terracotta art was also in its exuberance during this period. The human figurines were generally mould- made while those of animal were hand-made. The female figurines, which were more popular than male ones show rationalization in ornamentation and drapery and exquisiteness in hair style. The animal toys include elephant, bull, horse, etc. Terracotta disc, cart-wheel, ball, and marble constitute the other set of toys for the children. The material for ornaments recovered from this level comprise beads of jasper, carnelian, agate, terracotta and glass.

The remains of Period IV (AD 700-1100) are negligible and belong to only a single structural phase. The ceramic remains and the nature of contour of the deposit of this period marks a clear break from Period III. It indicates that the site was abandoned for a period of about five-six centuries. The knife-edged bowls and squat *handis* in red ware are the characteristic types of pottery of this early medieval culture.

HIMACHAL PRADESH

14. EXPLORATION IN DISTRICT KINNAUR

In continuation of the previous *(1996-97,* pp.33-38; work, Piyush Bhatt, Rahul Bhosle,

Jasmer Singh, Vinod Kumar and Rajesh Bakshi, under the guidance of C. Dorje of the Chandigarh Circle of the Survey, carried out extensive exploration/village-to-village survey in the remote areas of the district along the Rivers Spiti and Satluj from Yangthang (tehsil Hangrang) at Rekongpeo (District Headquarters). The antiquarian remains which are of archaeological importance and assignable to the tenth-eleventh to the eighteenth-nineteenth century AD are as under:

Tehsil	*Site/Village*	*Nature of remains*
Hangrang	Leo (31°54'N; 78° 40'E)	Leo is situated on the right bank of River Spiti. The stone-walled, flat-roofed, pillared Buddhist shrine known by the name of Tashi Lendup hosts a prayer wheel, stucco figures, *thankas,* manuscripts and masks. The temple has been reconstructed
-do-	Mailing (31° 54'N; 78° 40'E)	This squarish stone-walled, flat-roofed, pillared Buddhist shrine facing south and raised over a platform, known by the name of Dungyur. The walls are internally painted with different Buddhist deities and hosts a wooden prayer wheel and a stucco figure of Buddha placed inside the shrine. The shrine can be dated to sixteenth-seventeenth century AD
-do-	Nako (31° 53'; N; 78° 40'E)	Nako Buddhist Monastic-Complex has four crumbling, stone walled, flat-roofed pillared shrines namely Lhakhang Karbyung or Purgyal, Lotsva Lhakhang or Lhakhang C enpo, Gya-pag-pahi Lhakhang, Tsug Lhakhang and number of Chortens. Besides, there are another two shrines, one dedicated to Padamsambhava and another one with a huge wooden prayer wheel. The walls of all the shrines are profusely decorated with paintings. All these shrines are assigned a date between tenth-eleventh century and seventeenth-eighteenth century AD
Morang	Asarang (31°36'N;78°27'E)	Asarang is situated on the right bank of Tim" Khud and hosts a Hindu temple known as Narenash Devata Mandir. This rectangular shaped, wood and stone walled,,chalet roofed, pillared shrine raised over a huge platform comprises a cella and porch, a chorang situated a bit away, and a store room. The temple hosts a brass figure of Naga Devata and is ascribed to the nineteenth century AD

Tehsil	*Site/Village*	
Morang	(31° 37 N; 78° 22'E)	Jangi is situated on the right bank of Satluj. It hosts two shrines namely a Devata temple and a Buddhist shrine. The rectangular shape, wood and stone built, chalet roofed double-storeyed, pillared Devata temple facing east and dedicated to Gyanmagun Dombor Devata comprises a *garbhagriha* and a porch both raised over a high plinth. It is ascribed to eighteenth-nineteenth century AD The Buddhist shrine known as Samtan Chosling or Buddha Jangi shrine is recently renovated and comprises a cella and a hall with paintings and carvings of modern nature. The original shrine is ascribed to the eighteenth century AD
-do-	Lippa (31° 41'N; 78° 24'E)	Lippa is situated on the confluence of Titti and Lippa Khud. It hosts two shrines namely a Bodh-Lippa and a Narayana Devata shrine. The Bodh-Lippa shrine is a rectangular, flat-roofed, stone walled, two independent roomed, pillared, double-storeyed structure with a common circumambulatory path and aisle. The western room hosts a huge stucco figure of Shakyamuni flanked by Manjusri and Lokesvari towards right and left respectively. The eastern room hosts a figure of Maitreya. Morever all the walls are profusely painted with figures of deities and Siddhipurushas. Both are assignable to eighteenth-nineteenth century AD
-do-	Morang (31° 36'N; 78° 27 E)	Morang is situated on the left bank of River Satluj and hosts a huge complex comprising two forts, two entrances, one chorang and five other subsidiary structures. The complex facing east have wood and stone built, flat-roofed structures with the two forts being a double- and triple-storeyed, each standing on a very high platform. The entrance to the three-storeyed fort is via a four-tiered wooden door-frame showing Hindu deities with Vishnu seated on *lalatabimba*. The ancient fort may be assignable between tenth and eleventh century AD

Tehsil	*Site/Village*	*Nature of remains*
-do-	Rispa (31°35'N;78°25^{I}E)	Rispa is situated in the left bank of Satluj, the squarish chalet roofed, wood and stone-built, pillared Buddhist shrine facing east has been ascribed to sixteenth century AD
Morang	Thangi (31° 33'N; 78° 19'E)	Thangi is situated on the right bank of Morang Khud. It hosts a fully renovated, rectangular flat-roofed, wood and stone-built, pillared Buddhist shrine with a very large stucco image of seated Buddha in *varada-mudra*. Besides there are many other stucco images and paintings. The shrine re-constructed few years back, originally belonged to eighteenth-nineteenth century AD
Puh	Giabong (31° 43'N; 78° 27'E)	Situated on the right bank of Ti and hosts a Buddhist shrine known as Lagang. This rectangular stone-walled, flat-roofed pillared shrine facing north is raised over a low platform. The walls are internally painted profusely with Buddhist deities. It hosts a stucco figure of Buddha and a wooden prayer wheel-the later placed in the ante-chamber, ascribable to the sixteenth-seventeenth century AD
-do-	Kanam (31°40'N;78°27'E)	Kanam is situated on the right bank of River Satluj. It hosts four shrines namely Lagang monastery, Lundup - Gyambel monastery, Dhawala monastery and Kangyur monastery. The Langang manastery is stone walled, pillared, chalet typed, squarish shrine with a cella and a porch on plan. It hosts three Buddha stucco figures while the walls are profusely painted internally with modern retouches. Ascribed to eighteenth century AD, the Lundup Gyambel in stone, flat-roofed, double-storeyed, multi chambered residential-cum-prayer structure facing south-east with walls internally painted profusely and hosts member of staco figures, ascribable to thirteenth-fourteenth century AD. The Dhawala monastery is a chalet roofed, stone walled, pillared squarish shrine facing north and cella and a porch. The walls are profusely painted from inside. A small chorang can be seen to the front of the shrine. It can be ascribed to eighteenth-ninteenth century AD. The Kangyur monastery is a flat-roofed, stone walled, squarish, double storeyed pillared fort like shrine facing south and comprising of a cella with few ante-chambers. The cella doorframe is of three *sakhas* and hosts a chorten flanked by two chorangs. The walls carry square steatite tiles locally known as *thankas*. Besides, there are good number of religious items within. The shrine is ascribed between eleventh and twelfth century AD

	Site/Village	*Nature of remains*
Puh	Karala (31° 40'N; 78° 26'E)	Situated on the right bank of River Satluj over Spilo, this rectangular stone walled, flat-roofed huge complex raised over a high platform comprises a cella, a hall, a circumambulatory path and three subsidiary structures. The wooden door-frame shows three *sakhas.* The shrine hosts a huge prayer wheel at the centre while the walls show painted figures of Lokeshvara, Chuhik-Jal and Kharsapani on south-east, south-west and west respectively besides many other stucco figures, paintings, wall-hangings, *thankas* and manuscripts. The shrine is assigned to eighteenth-nineteenth century AD
-do-	Khab (31°45'N;78°40'E)	Situated on the left bank of River Satluj, the rectangular, stone walled, flat-roofed shrine facing west is presently in a renovated form housed within the residence of a villager. It hosts thirteen miniature stucco figures of Buddha and assignable to eighteenth-nineteenth century AD
-do-	Labrang (31°41'N;78°26'E)	Labrang is situated on the right bank of Satluj over Karla. This squarish, five-storeyed wood and stone-walled fort dedicated to Hindu God Pyakara Deva and Thung-Thung Gyalboi. Facing south the fort in each storey contain four rectangular dwarf rooms which are raised on a very high platform. The first floor hosts the figures of above Devatas in two rooms while a bas relief figure on slatestone that of Buddha is placed in another. Devoid of any other mode of decoration, the fort is ascribable to the fourteenth-fifteenth century AD
-do-	Namgya (31° 48'N; 78° 40'E)	Situated on the left bank of Satluj, the rectangular stone-walled, flat-roofed, pillared-shrine facing west, known as Buddha-Lagang shrine has a cella and two ante-chambers. It is raised on a low platform and hosts three stucco figures that of Buddha Padamsambhava. A prayer wheel can also be seen within. Besides it the walls are painted with Buddha figures. This shrine is ascribable to the sixteenth-seventeenth century AD

Tehsil	*Site/Village*	*Nature of remains*
Puh	Puh (31° 48 N; 78° 25'E)	This rectangular stone-walled, flat-roofed pillared Buddhist shrine facing east is known by the name of Thakur Lhakhang. Internally the walls are decorated with paintings and seated stucco images of Buddha flanked by devotees in the centre of altar. The shrine is dedicated to Lotsva Rin chen zangpo and placed between eleventh and twelfth century. However, the shrine was renovated at a later date. Besides it, near the hamlet of Koro, a rock inscription stands out in the barley fields credited to Yes e od, the Lama King of Guge
-do-	Ropa (31°48'N;78°25'E)	Ropa is situated on the left bank of Ti and hosts two Buddhist shrines known as Narik Choling and Tsug Lhakhang. The Narik Choling is stone-walled, flat-roofed, pillared, squarish shrine and facing east. The walls are internally painted profusely with different deities and host stucco figures and a wooden prayer wheel. It is ascribable to the eighteenth-nineteenth century AD
-do-	Rushkalang (31° 46'N; 78° 28'E)	Located on the left bank of Ti, this multi-chambered, stone-walled, flat-roofed pillared-Buddhist shrine facing south-west is known as Tashi Choling and ascribable to eighteenth-nineteenth century AD. Besides there are three other Chortens within the complex
-do-	Sangnam (31° 46'N; 78° 31'E)	Located on the left bank of Ti and hosts two shrines namely Tashi Yangling and Yulsa Devata shrine. The Tashi Yangling dedicated to Buddha faces south-east and comprises a cella, a hall and six ante-chambers with three on either side of the hall. The roof is flat and has wooden shingles with top one in circular fashion. The walls are of stones with wooden beams placed at regular intervals. The wooden gateway shows three *sakhas.* The hall is internally painted profusely with Buddha figures, etc. The ante-chambers, besides paintings hosts three prayer wheels and five huge stucco figures. It is assigned to rin-chen zang-po during the early years of eleventh century. The Hindu shrine of Yulsa Devata has a main chamber squarish on plan, oriented east-west with a verandah each on three sides. The temple stands on a high platform. The roof is in wood. The wood carving and decoration are of recent origin. It is ascribable to the seventeenth-eighteenth century

JAMMU AND KASHMIR

15. EXCAVATION AT KANISPUR, DISTRICT BARAMULLA

Srinagar Circle of the Survey, under the direction of B.R. Mani, assisted by P.C. Chaudhari, Sujeet Nayan, M.K. Joshi, P.L. Meena, Balbir Singh, Gulzar Singh, R.K. Kaul, Raju Ranjan, Raghubir Singh, Sultan Dar, G.H. Malla, S.N. Singh, Ashvani Kumar, VK. Kaul, Arunji Sidha, P.N. Sharma, Thaman Singh Thapa, Akbar Khan and Amrik Singh, carried out excavation at Kanispur, also known as Kanishpur or Kanispora in Baramulla district of Kashmir which is a prolific neolithic and historical site on the left bank of Jhelum *{Vitasta)* and has been identified with Kanishkapura mentioned by Kalhana (AD 1148-49) in his *Rajatarangini* as a city founded by Turushka king Kanishka, who is well known in history as the famous ruler of the Kushan dynasty. With the objective to confirm the tradition of foundation of Kushan city through archaeological finds, particularly in view of the occurrence of neolithic pottery from the surface at the site, suggesting an earlier occupation of the site and to know the cultural sequence and settlement pattern in different periods, three different areas of the site were selected for excavation.

The flat top of the *karewas* known as Rajteng along with its southern slopes were occupied during the neolithic times as proved by the excavation and after a gap of several centuries large religious structures were erected there during the Kushan rule. The Kushan city of Kanishkapura was founded towards south-west of Rajteng on the comparatively flat ground in the modern village area where Kushan deposit was found just overlying the natural soil which confirmed the tradition of foundation of the city by Kanishka. In total 39 quadrants of 17 squares (10 X 10 m) were fully or partly excavated (fig. 1).

A preliminary study of the deposits suggests a sequence of five cultural periods.

Aceramic neolithic level was encountered in Sq A2, Qdl at KNP-1 overlying the natural soil. The deposit was approximately 15 to 20 cm in thickness bereft of any ceramic industry (fig.2). A stone celt was found from the deposit. Four successive floor levels along with post-holes being part of rectangular houses were noticed in the levels of Period II which probably had thatched roofs. A hearth in association with an earthen pot and a jar along with the characteristic neolithic pottery and a stone celt were found (pl. 10). Evidence of circular pits have also been noticed.

The average thickness of the ceramic neolithic level was found to be 1.60 to 2 m. The ceramic industry comprised both hand-made as well as wheel turned pottery (figs.3, 4 and 5). Fine and coarse grey ware, red ware, dull red ware, black ware and buff ware are important types with vases, bowls, pots and dishes on stand. Brushing treatment given with reeds to make the surface of the wet pots smooth have left vertical, horizontal and slanting marks of groovings. Evidence of special coil technique in making hand-made pottery was noticed besides use of siliceous grit added to the clay paste as binding material. The disc bases of the pots have variety of mat-impressed designs. Polished stone celts (figs.6 and 7) have been found from different levels (pls. 11-12) along with some bone points (pl. 13). The evidence of a bangle piece, a needle, two pins, and ear or nose ring and a chisel-all in copper from the last phase of the Period II suggest

Fig. 1

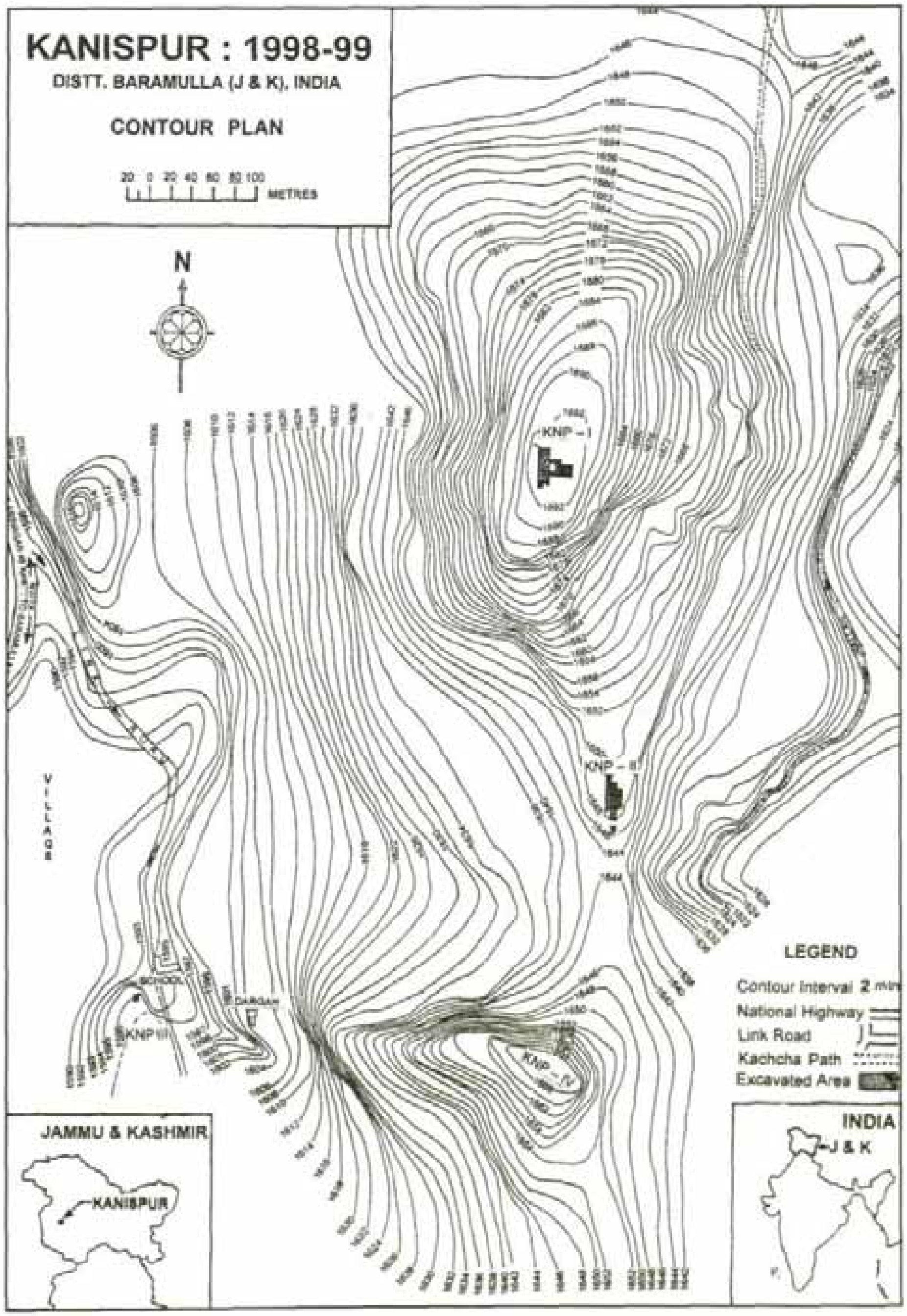

KANISPUR : 1998-99
DISTT. BARAMULLA (J & K), INDIA
CONTOUR PLAN
METRES
N
KNP - I
KNP - II
KNP - III
KNP - IV
SCHOOL
DARGAH
VILLAGE
LEGEND
Contour Interval 2 m
National Highway
Link Road
Kachcha Path
Excavated Area
JAMMU & KASHMIR
KANISPUR
INDIA
J & K

Fig. 2

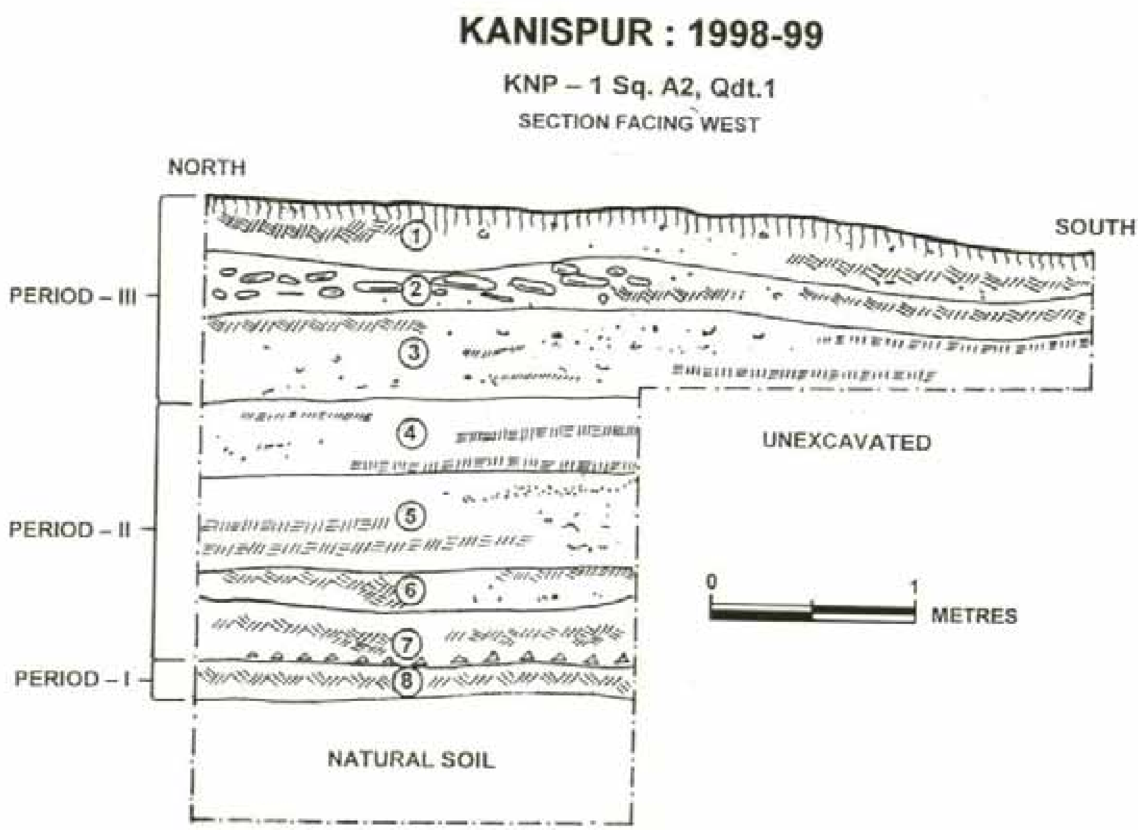
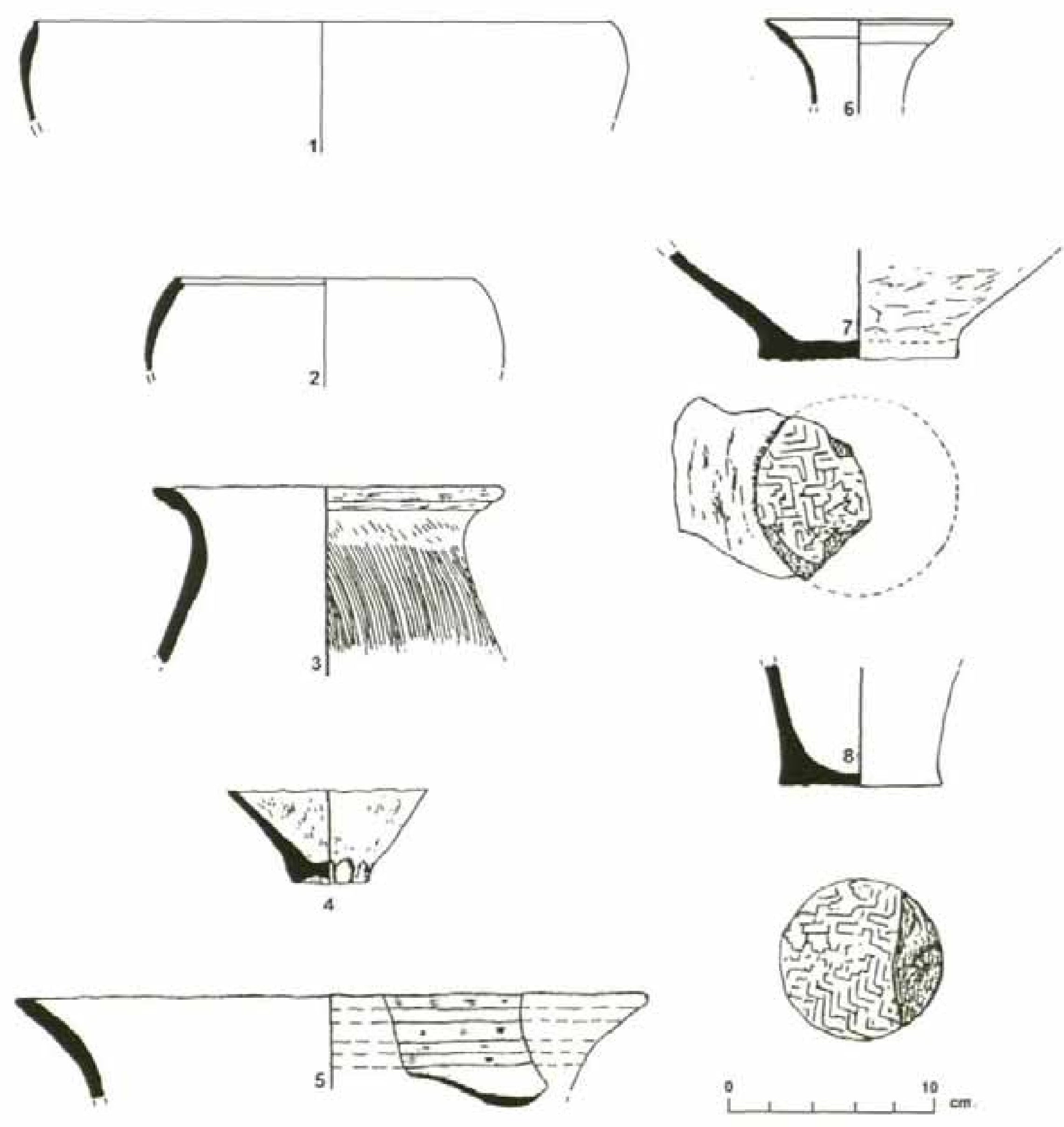
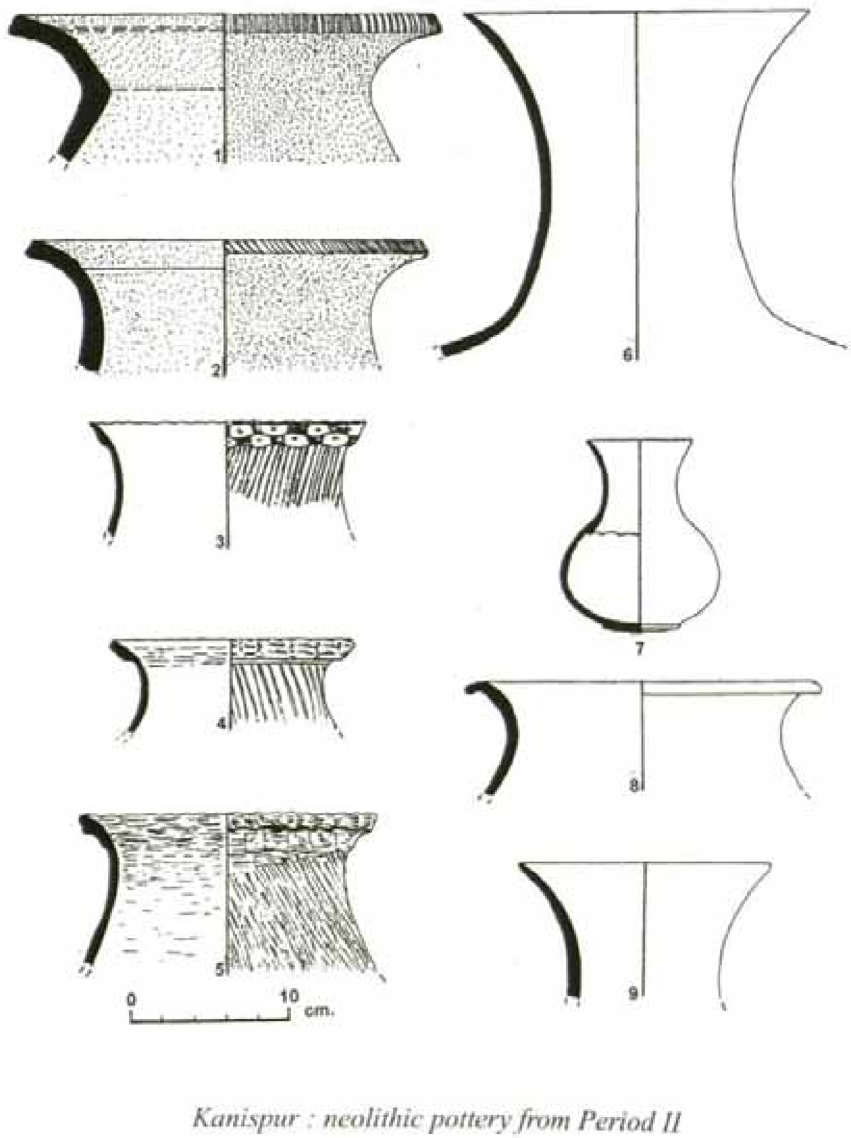

KANISPUR : 1998-99
KNP – 1 Sq. A2, Qdt.1
SECTION FACING WEST
NORTH
SOUTH
PERIOD – III
PERIOD – II
PERIOD – I
UNEXCAVATED
NATURAL SOIL
0
1
METRES
1
2
3
4
5
6
7
8

Fig. 3



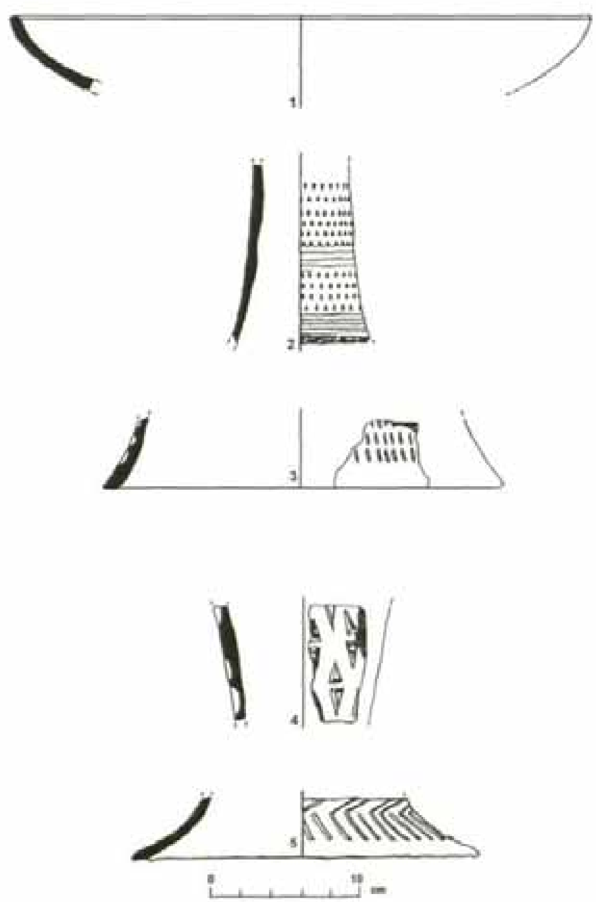
Kanispur : neolithic pottery from Period II

Fig. 4



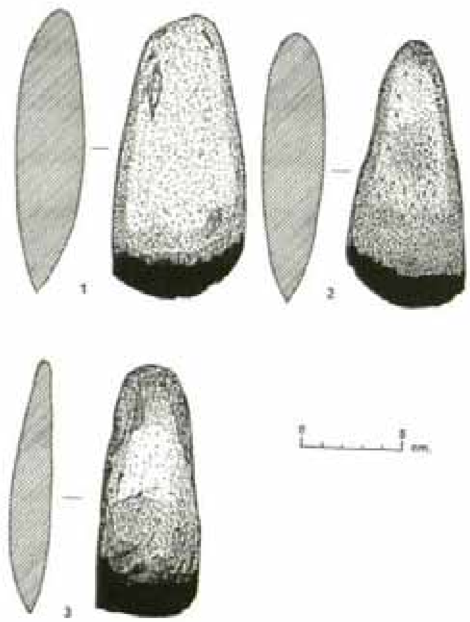
Kanispur : neolithic pottery from Period II

Fig. 5

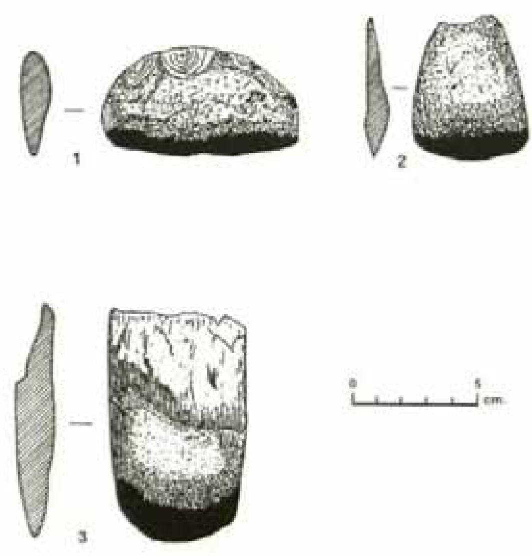


Kanispur : neolithic pottery from Period II

Figs. 6-7



6



7

Kanispur : 6-7, neolithic stone tools

Plate 10



Kanispur: neolithic floor

Plates 11-12



11



12

Kanispur : 11, neolithic stone tools and 12, celts

Plates 13-14



13



14

Kanispur : 13, *neolithic bone tools and* 14, *diaper pebble wall*

the chalcolithic contact, similar to the evidence from neolithic Burzahom and Gufkral.

While the area KNP-3 did not yield any neolithic evidence, large-scale building activity in the form of structures of various types assignable to the early centuries of the Christian era was noticed in all the three areas excavated. Parts of a huge structure of Kushan period (Period III) were traced upto a length of 22 m and breadth of 17 m at Rajteng which was constructed of diaper pebble walls (pl. 14) with lime brick floor. A lime brick pavement was attached with these walls in the inner side of the structure. In between the pavement and the diaper pebble wall were put vertically placed line of single course of plain brick tiles, each measuring 27 X 19 X 5 cm, the upper edges of which were damaged. Size of the lime bricks of the pavement is 40 X 31 X 12 to 15 cm. Before providing the lime brick pavement, stone chips and rubbles were spread and pressed inside the structure to strengthen the flooring. Evidence of decorated stucco work was found in the form of a few pieces with floral designs and red paint on a chunk of lime-plaster. Three courses of vertically placed plain brick tiles in a series of twelve tiles in each course with flatly placed tiles below were found attached with section facing east of Qd 4 of Sq Al. Roof tiles with circular holes for iron nails suggest wooden superstructure.

On the slopes in KNP-2, a damaged pavement of decorated terracotta tiles with the pattern of a large disc having several concentric circles made of the tiles was exposed (pl. 15). Floral decorations and medallions with *dharmachakra* motif, Brahmi letters and Kharoshthi numerals were found on the tiles (fig.8; pl. 16)

Habitational deposit with the thickness of nearly 2.50 m of the Kushan period (pl. 17) was seen in Sq. Al, Qd2 at KNP-3 overlying the natural soil (fig 9). The mound represents the main township of Kanishkapura founded by Kanishka as evident from the archaeological evidence of the first settlement of the site during the period. Layers 10 to 5 belong to this period. A random rubble wall, 35 cm high and 47 cm wide was noticed running from south-east to north-west and contemporary to layer 8 and sealed by layer 7. It was noticed only in the southern half of the quadrant upto a length of about 1 m as its ends were attached with the sections and could not be exposed further.

Red ware was the main ceramic industry (figs. 10-11) with shapes of a variety of bowls, goblets, spouted pots, basins, dishes or pans with incised or stamped-decorations around the rim, lids, cooking pots, vases and plates with central knob and circular base. A rare 8 cm high goblet of fine red ware with deep flared mouth, constricted neck and convex reed flutings round body between shoulder and base was found form layer 9 which is quite similar to those found from Sirkap and Mahal at Taxila in fine red ware, silver, copper and bronze, dating back to the early part of the first century AD. A typical Kushan lamp with horizontally flat incurved rim was found from the early level of the period. A Kushan copper coin, silver pendant, stone lid, terracotta figurines, piece of blue glass bangle, a stone grinder, iron nails and arrow-head were important antiquities found from Kushan levels. Red ware continued in Period-IV and V with a little change in shapes (figs. 12-13). A circular copper coin of Bhimagupta {*circa* AD 975-981) was found from the top levels of Period V. Huge earthen pots and jars covered with circular stone lids from the levels of Period V suggest evidence of a granary.

Plates 15-16



15

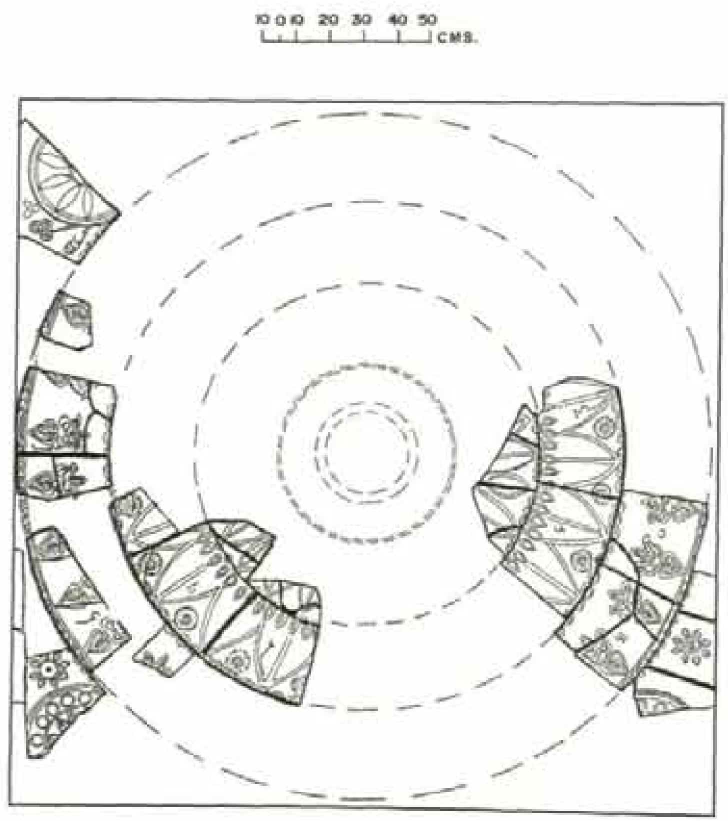


16

Kanispur : 15, *pavement of decorated tiles and* 16, *close up of tiles*

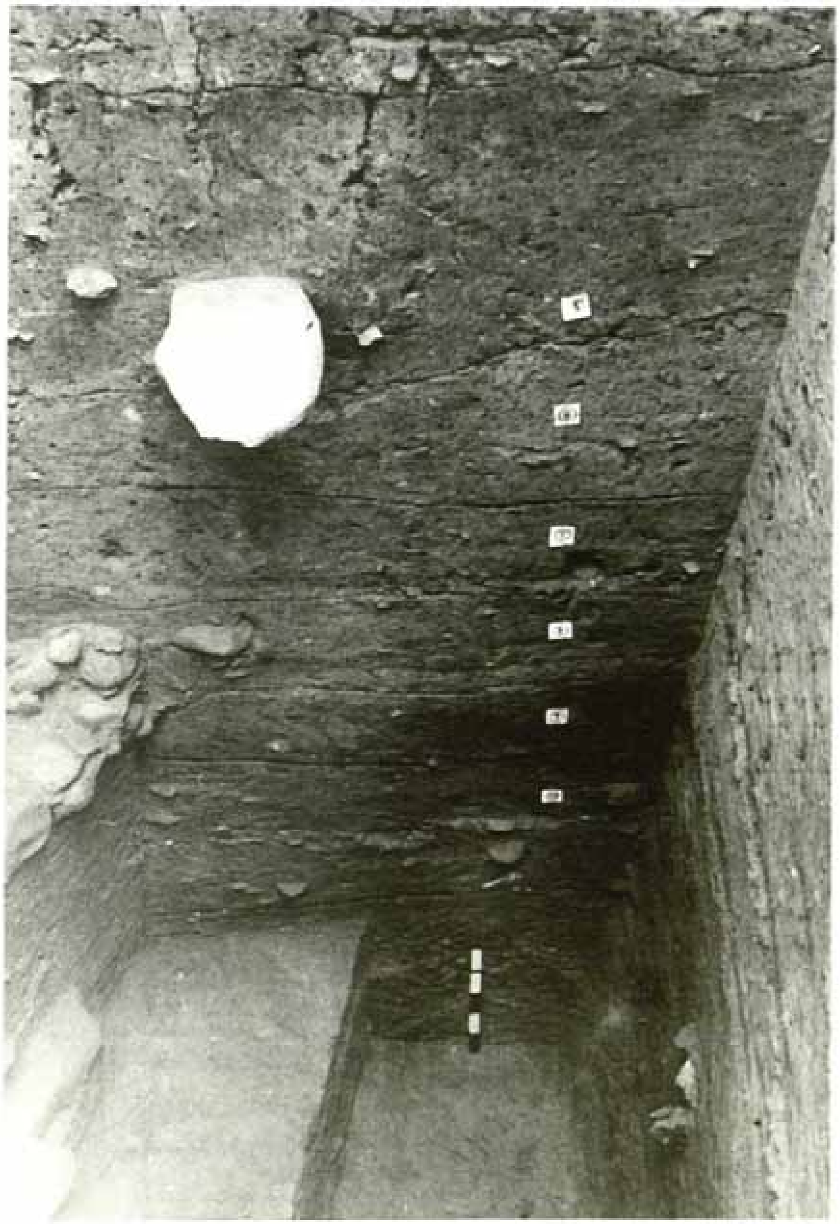
Fig. 8

KANISPUR (KNP-2) 1998-99
TERRACOTTA TILE PAVEMENT



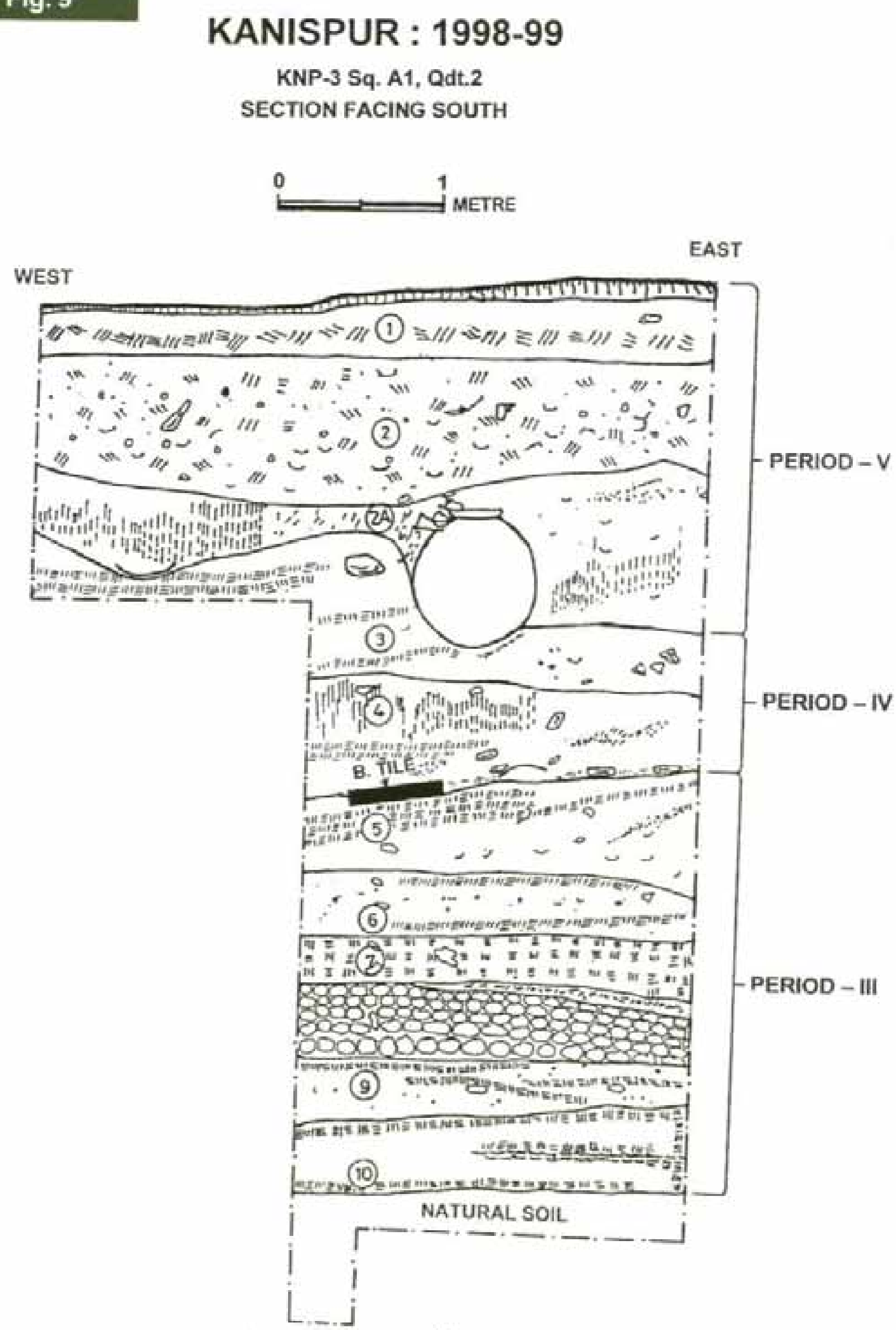
Kanispur : terracotta tile pavement

Plate 17



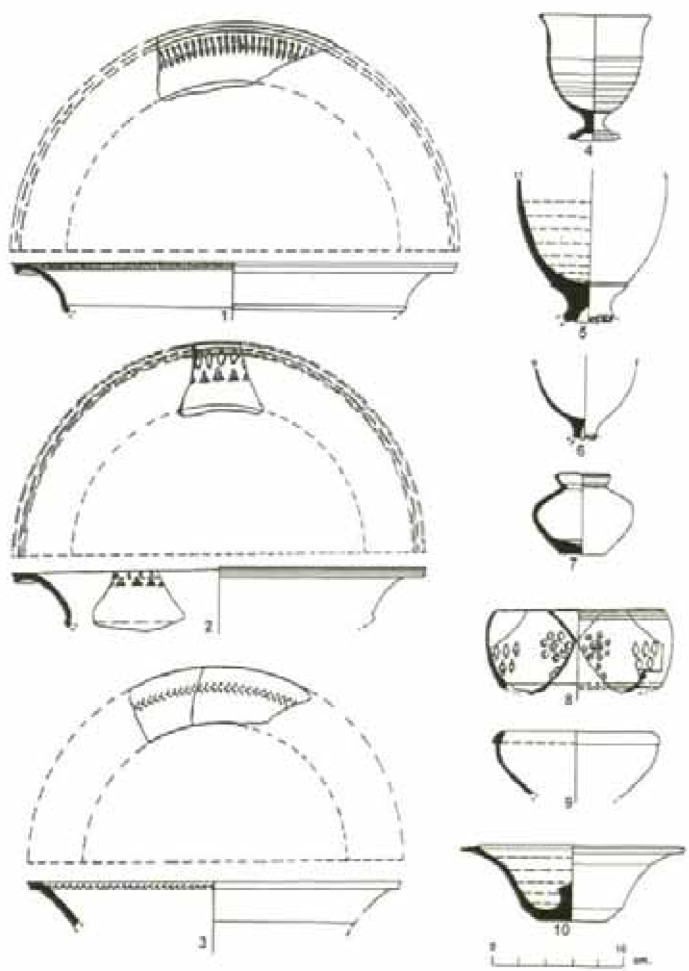
Kanispur : Kushan deposits

Fig. 9


KANISPUR : 1998-99
KNP-3 Sq. A1, Qdt.2
SECTION FACING SOUTH
0
1
METRE
WEST
EAST
1
2
2A
3
4
B. TILE
5
6
7
9
10
NATURAL SOIL
PERIOD – V
PERIOD – IV
PERIOD – III

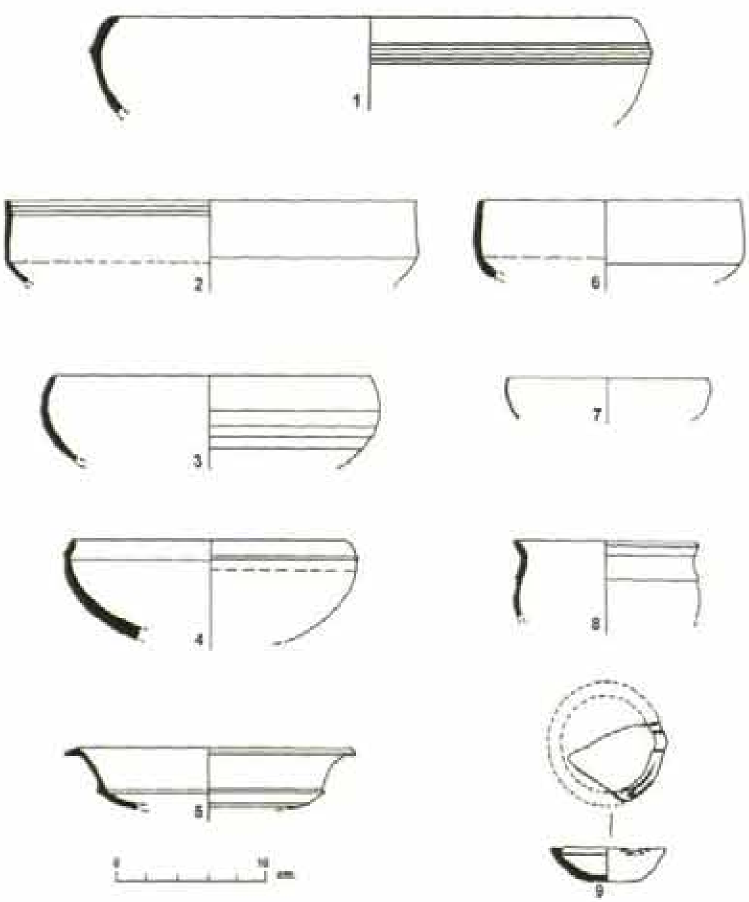
9

Fig. 10



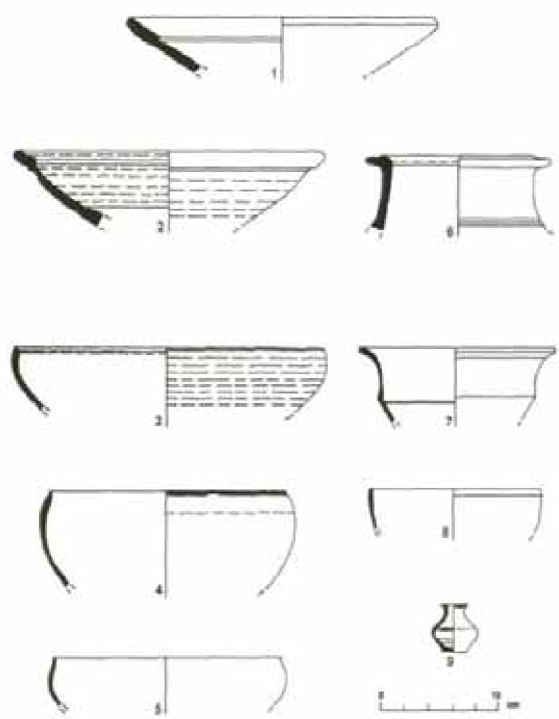
Kanispur : pottery from Period III

Fig. 11



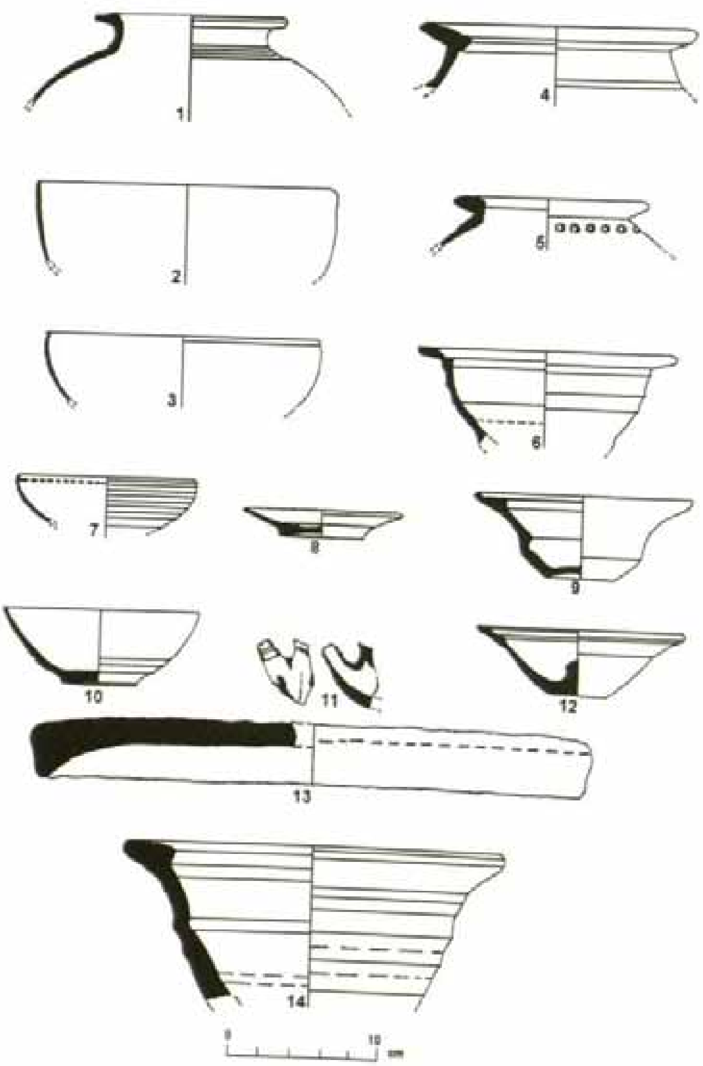
Kanispur : pottery from Period III

Fig. 12



Kanispur : pottery from Period III

Fig. 13



Kanispur : pottery from Period IV

16. Excavation at Jafar Chak, District Jammu

Srinagar Circle of the Survey, under the direction of B.R. Mani, assisted by P.C. Chaudhari, Vijay Shankar, Sujeet Nayan, Balbir Singh, Gulzar Singh, R.K. Kaul, Raju Ranjan, Raghubir Singh, S.N. Singh, G.B. Singh, Shyam Lai, V.K. Kaul, A.K. Kaul, Arunji Sidha and S.K. Bhat carried out excavations at the mound in Village Jafar Chak in the Marh Block located at a distance of 19 km west of Jammu. The work was carried out in 11 quadrants of 4 squares, measuring 10 X 10 m each (fig. 14; pl. 18). Excavation at the site revealed the early and late medieval ceramic assemblage in the habitational deposit of about 7 m thickness (pi. 19) which can be divided into three successive cultural periods - Period I, represented by deposits of sixth-seventh centuries and to the ninth century AD; Period II represented by deposits of ninth to the thirteenth century AD and Period III belonging to the thirteenth-eighteenth century AD (fig. 15). Decorated bricks of Period I were reused in succeeding periods when the size of bricks as found from structures datable to about fourteenth century was 28 X 20 X 4 cm. Structures of Period III show deterioration of settlement as large size pebbles were also used with bricks, reused bricks and brickbats. A sunken brick-paved floor of a room was encountered measuring 3.70 x 2.45 m. A sterile deposit of about 35cm thickness above the habitational layers of Period-I suggests the evidence of flood in the area. Red ware was the predominant pottery (pl.20) throughout with slight change in shapes. Both plain and black painted pots have been found. Basins, cooking pots, lids, jars and vases are commonly found. Small sharp edged bowls were found from the late levels while bowls of earlier levels are larger and have thicker rim. Terracotta, stone and glass beads, gamesmen, fragmentary iron and copper objects, bone and shell objects including bangle pieces (pl. 21) and terracotta animal figurines were found. Among the interesting antiquities, a silver bracelet studded with semiprecious stones (pl. 22) belonging to the earliest deposit of Period III and a copper coin of Sultan Zain-ul-Abidin (AD 1421 to 1472) from a late level of Period HI are noteworthy.

17. Exploration in Ladakh

B.R. Mani, assisted by Balbir Singh, Gulzar Singh, Phuntsok Dorje and S.N. Singh of the Srinagar Circle of the Survey, carried out explorations in Leh and Kargil districts of Ladakh with an objective to locate and document prehistoric, early historical and medieval rock engravings and carvings (fig. 16). It was noticed that the rock engravings, particularly those on boulders in river valleys, are the earliest remains of the cultural heritage of Ladakh as they depict scenes of prehistoric (pl.23), early historical (pl.24) and later historical life of man and culture of the region. The earliest ones are represented by animal figures of ibex, yak, goat, deer, dog, wolf, horse and human figures including those hunting with bow and arrow or with spear and in dancing positions in groups, horse riders, fighting scenes and symbols of sun, palm, *svastika* and others. They were sometimes copied in later periods also as are evident from overlapping and scratchings without patina and looking fresh on granitic boulders. The latest engravings are represented by stupas or Chortens with or without Tibetan inscriptions mentioning names of persons and years in Tibetan calendar.

Fig. 14

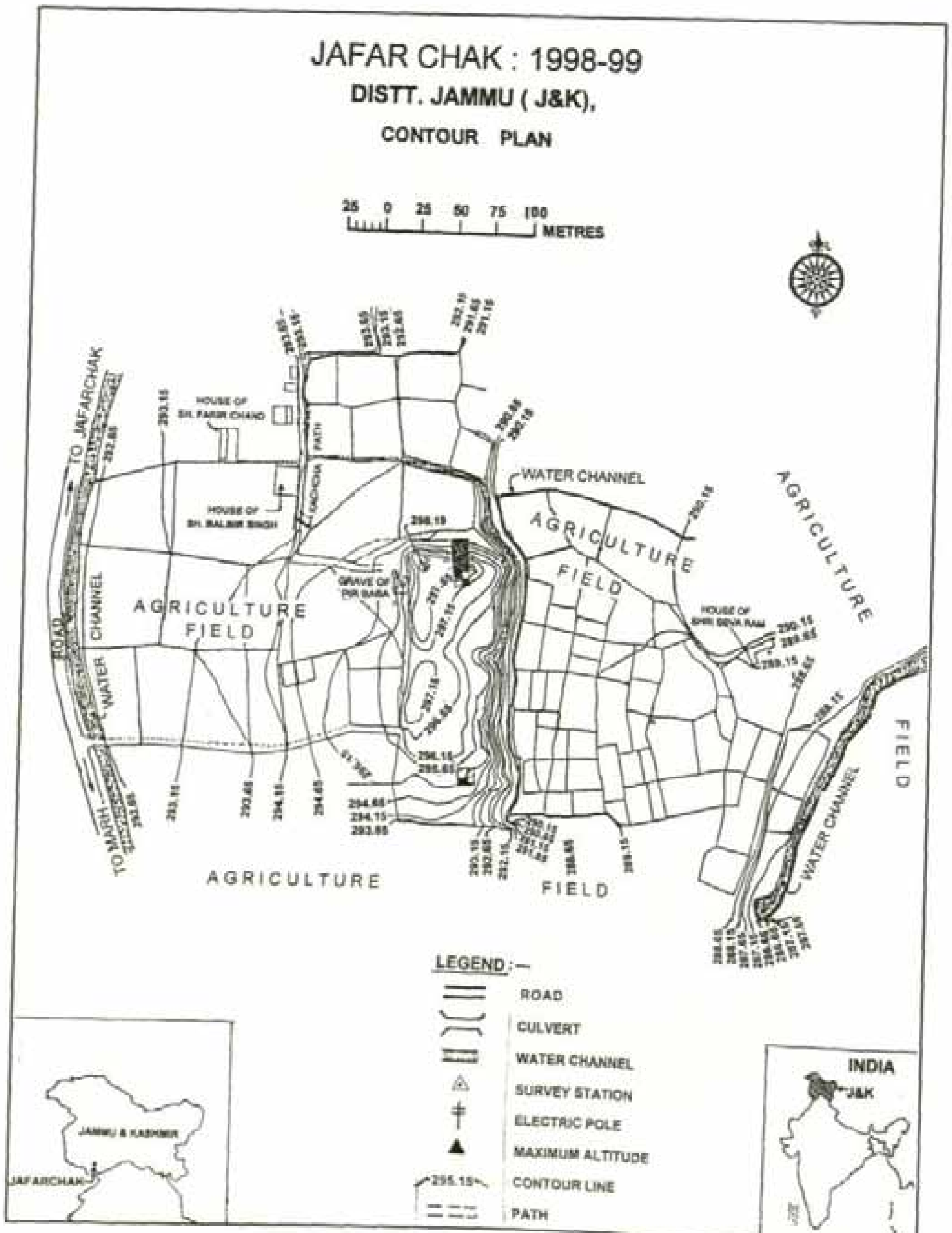
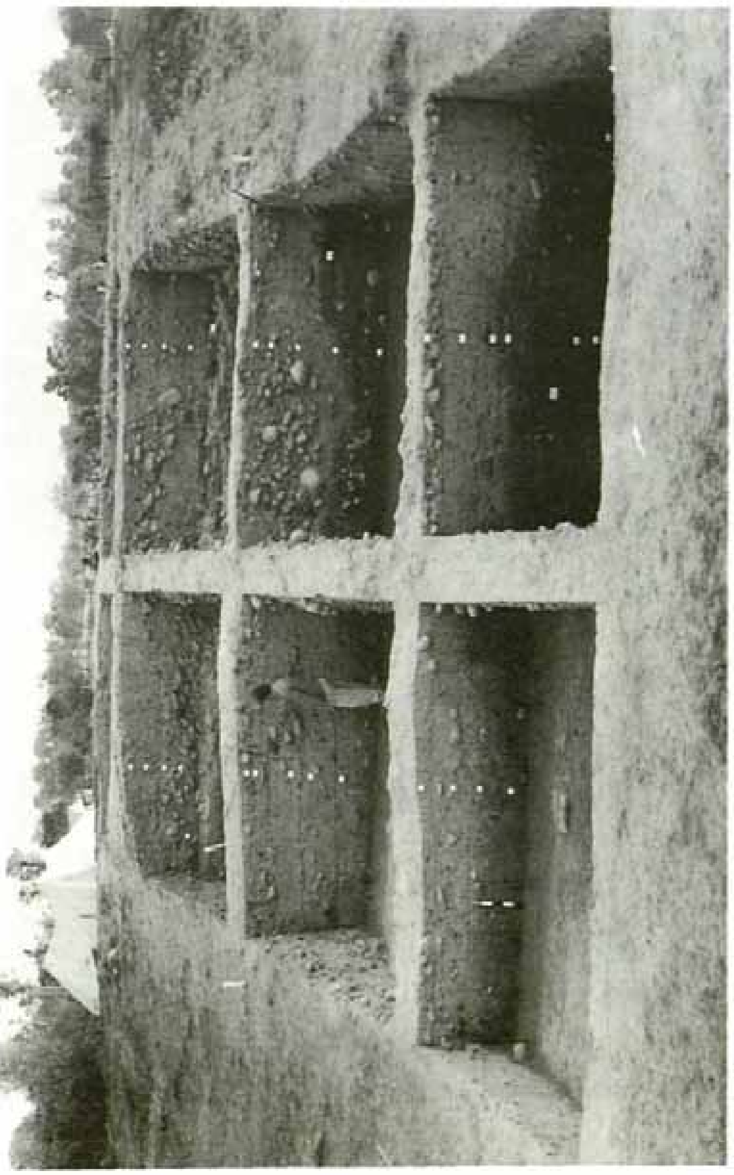
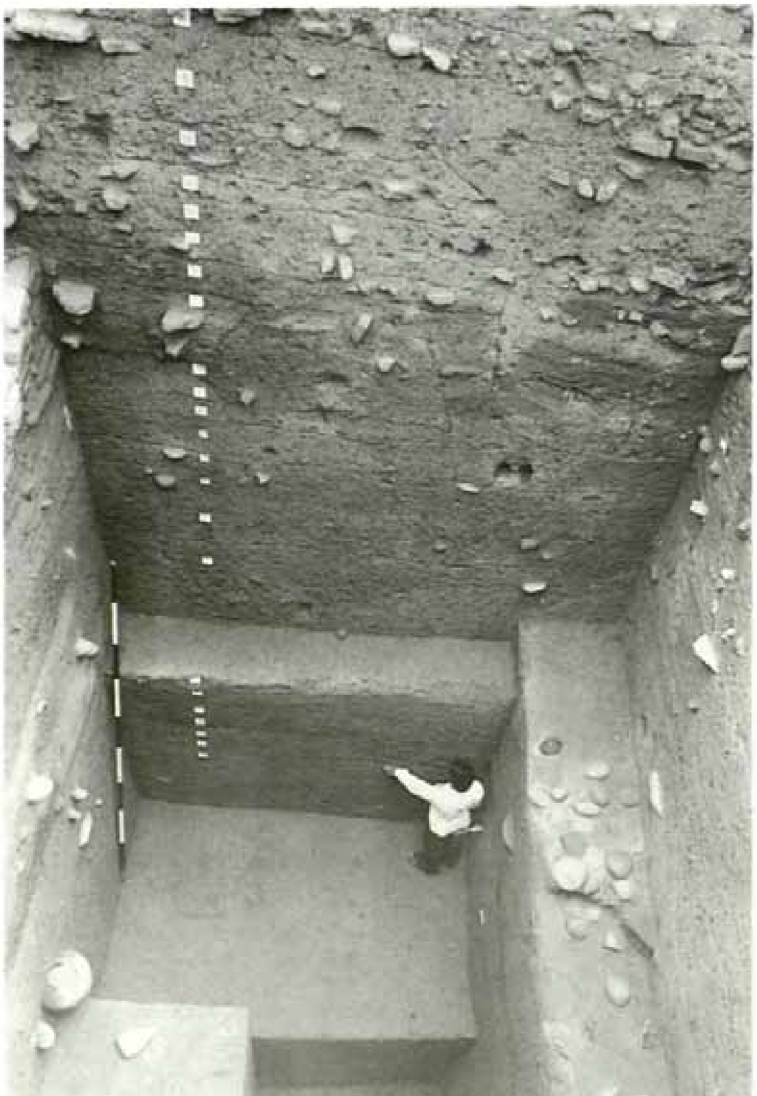

JAFAR CHAK : 1998-99
DISTT. JAMMU (J&K),
CONTOUR PLAN
METRES
TO JAFARCHAK
TO MARH
ROAD
WATER CHANNEL
AGRICULTURE FIELD
AGRICULTURE
FIELD
WATER CHANNEL
LEGEND :-
ROAD
CULVERT
WATER CHANNEL
SURVEY STATION
ELECTRIC POLE
MAXIMUM ALTITUDE
CONTOUR LINE
PATH
JAMMU & KASHMIR
JAFARCHAK
INDIA
J&K

Plate 18



Jafar Chak : excavated trenches

Plate 19

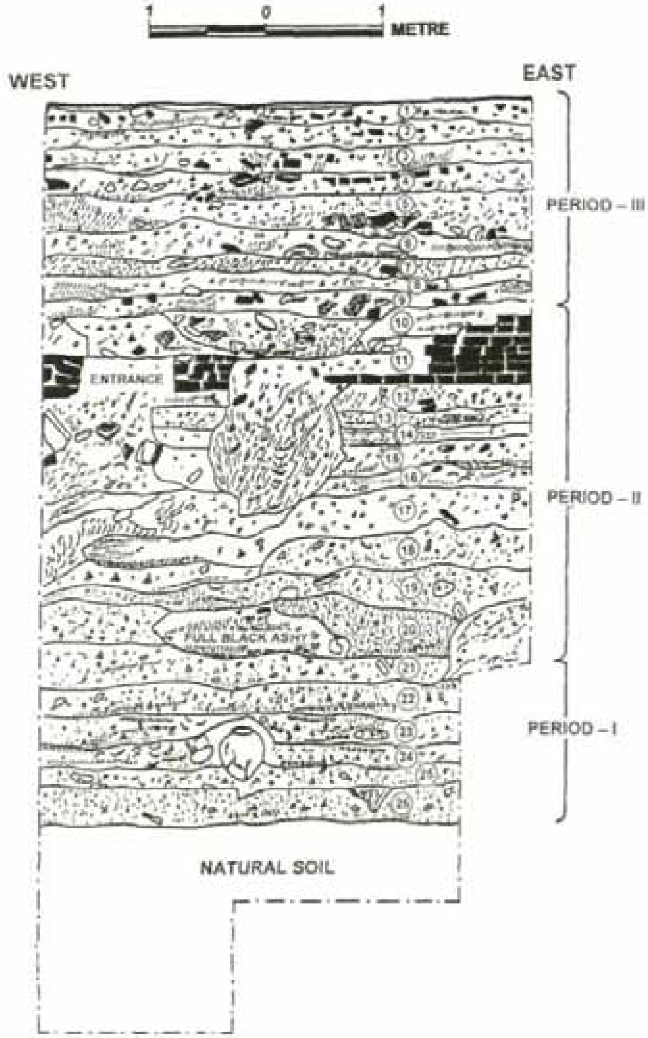


Jafar Chak : cultural deposits

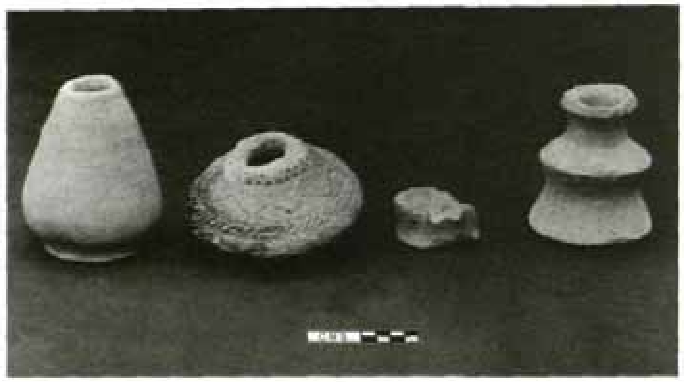
Fig. 15

JAFAR CHAK : 1998-99

JCK Sq. A1 Qdt. 1
SECTION FACING SOUTH



Plates 20-22



20



21



22

Jafar Chak : 20, shapes in red ware; 21, bone and shell objects and 22, silver bracelet

Fig. 16

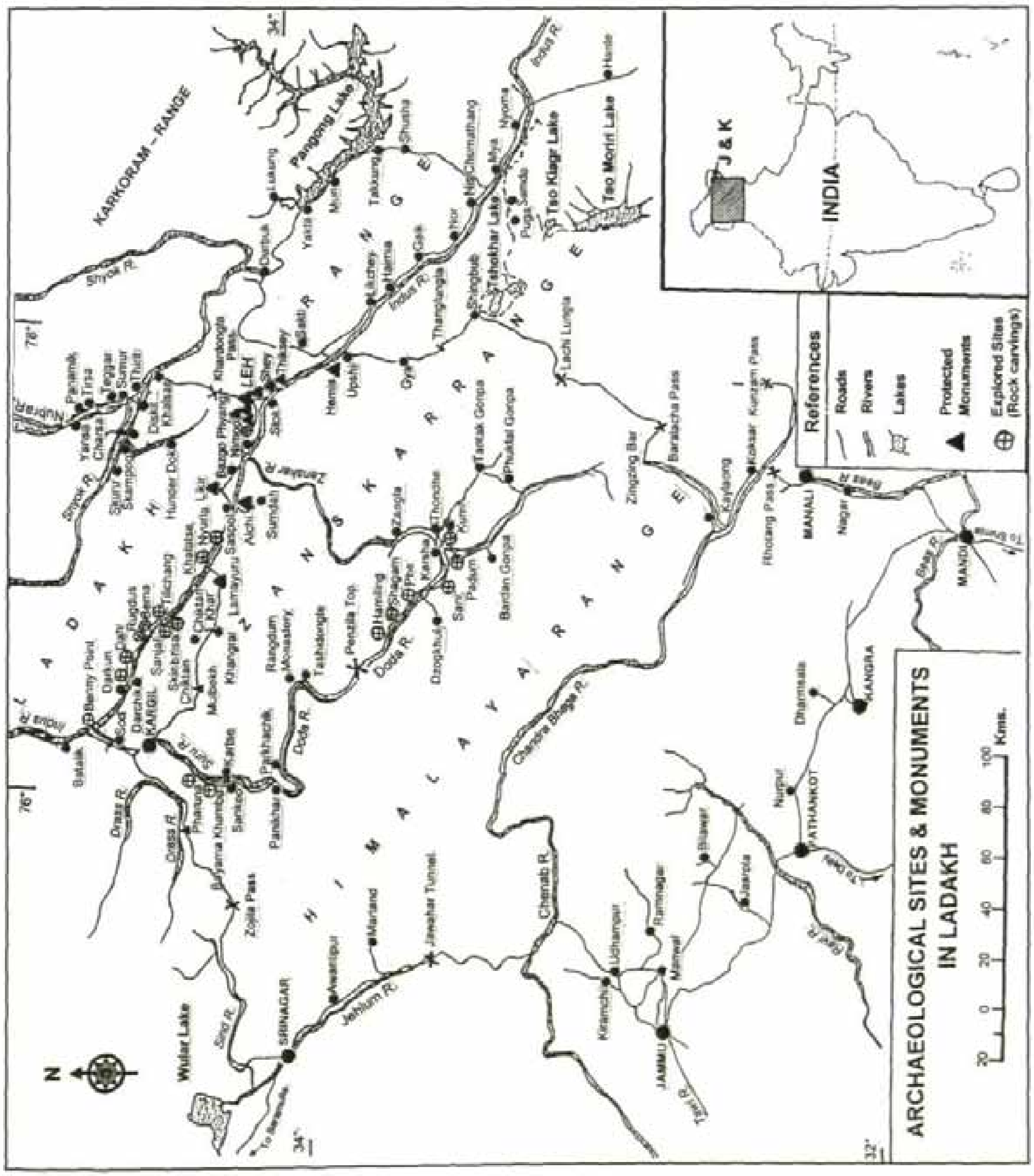
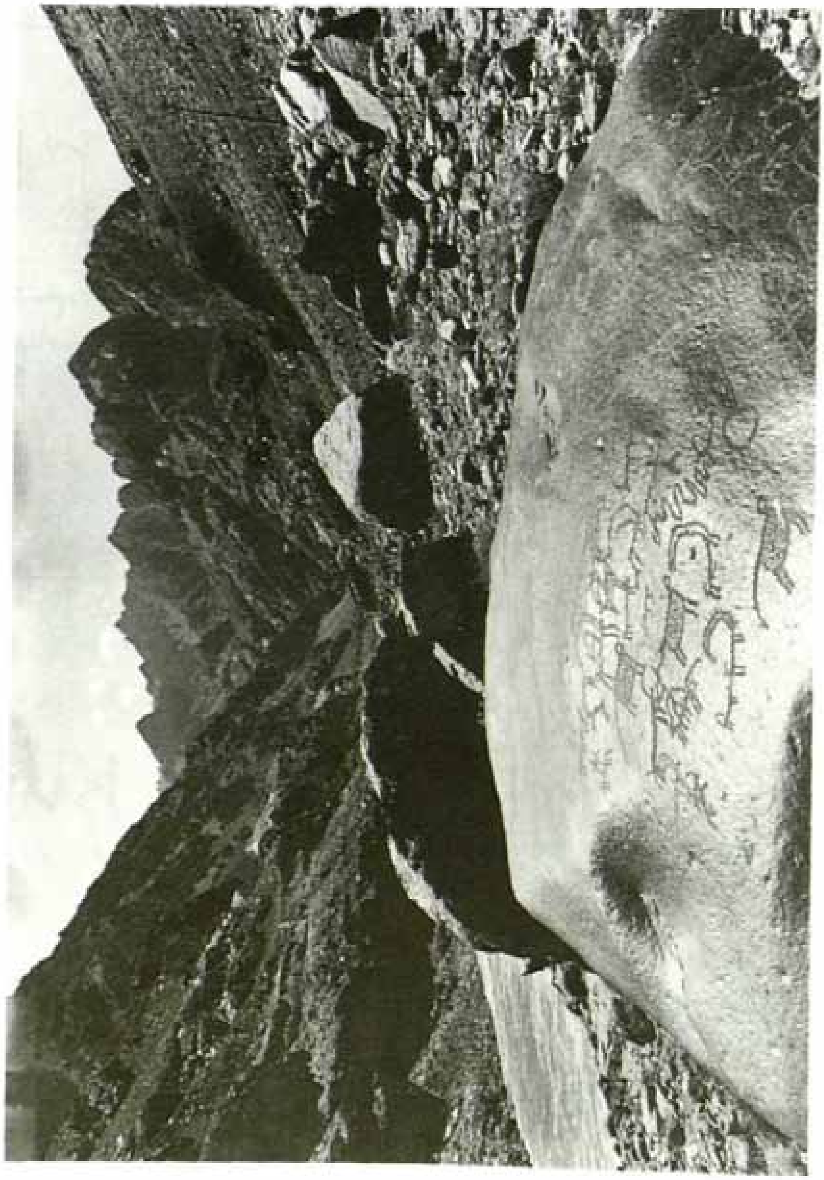

ARCHAEOLOGICAL SITES & MONUMENTS IN LADAKH
References
Roads
Rivers
Lakes
Protected Monuments
Explored Sites (Rock carvings)
20 0 20 40 60 80 100 Kms.
KARKORAM - RANGE
INDIA
J & K
Pangong Lake
Tso Moriri Lake
LEH
KARGIL
SRINAGAR
JAMMU
MANALI
KANGRA
PATHANKOT
MANDI
Wular Lake
Zojila Pass
Rhotang Pass
Chenab R.
Indus R.
Zanskar R.

Plate 23



Kargil (Ladakh) : prehistoric engravings

Plate 24



Kargil (Ladakh) : early historical engravings

The investigations were carried out along the banks of Indus, Sum, Doda and Zanskar rivers and many new sites with engraved boulders, camping grounds and rock-shelters were discovered suggesting ancient trade routes frequented by traders, nomads, Buddhist monks and marching armies. The main emphasis was given to locate such sites on Kargil-Padum Road (approximately 243 km) and beyond Padum upto Thongde (about 15 km), along the banks of Indus from Leh to Batalik (approximately 175 km) and Khangral to Sanjak on Indus (about 30 km).

On the Kargil-Padum Road, primitive rock engravings were found on a large boulder at Khumthang near village Pharuna (27 km from Kargil). They include ibex figure, a human figure with rounded hands, ibex body composed of two triangles, moving human figures with different hand postures possibly performing a dance, horse with rider shown as if rider is standing on horse. There is rock-cut cavity in a large boulder about 40 m south-east in which one man can easily sleep. 6 km ahead at Byama Khumbu near the carving of Padmapani there is a rock with solitary figure of an ibex. Such engravings were noticed at ancient camping grounds at two places near Hamiling at Shagam and Phey on the way to Padum.

15 km from Padum to Thongde, reaching via Pipiting on the right bank of River Zanskar in-between Kumi and Thongde in a stretch of about 2 km, near the confluence of Doda and Zanskar, there are large number of boulders with rock engravings of primitive type. Ibexes of various designs and sizes are depicted on them besides scenes of ibex hunting with bow and arrow by the hunters, two ibexes fighting together, two men hunting one ibex with bows and arrows, a frog-like creature, an animal with four legs and rounded body with rounded head and ears and sun-shaped human body. Amongst these, an interesting scene depicts five wild animals in a line, three moving to right and two to left. Amongst the three, the one at the end is a tiger chasing a cattle and the two left figures seem to be wild asses which are still found in Ladakh, particularly in the eastern part around Changthang.

About 29 km from Khangral, a number of boulders with engravings along with their later copies were noticed on the bank of the stream at a place called Skinbrisa. The stream joins the Indus 2 km ahead at Sanjak. At Skinbrisa no less than forty-seven ibex figures were noticed on a single boulder. Apart from usual ibexes, a man hunting ibex with bow and arrow, ibex made with the help of two triangles and chasing buffalo scenes were found. The most striking depiction is that of a battle scene with horse riders, atleast six on one side and four on the other holding long spears and two foot soldiers holding bow and arrow.

Rock engravings of primitive type were noticed all along the Indus from Leh to Batalik with more concentration of engraved boulders at Phyang, Saspol, Nyurla, Khalatse, Tilichang, Bema, Rugdus, Dah, Darkun, Darchik and Benny point. Figures of ibex seem to be related to ritualistic offerings connected with child birth.

Besides primitive ones, rock-engravings representing Chortens or stupas and Tibetan inscriptions datable after ninth century AD have been noticed on both sides of Indus at Saspol and Khalatse. Rock-carvings of this period representing gigantic figures of Padmapani Avalokitesvara, Maitreya and Dhyani Buddhas were found at places like Byama Khumbu, Kartse Khar, Sani and Padum.

18. EXPLORATION IN DISTRICT LADAKH

The Excavation Branch V, Vadodara of the Survey, under the direction of R.S. Fonia, assisted by Y.S. Rawat, V.H. Parmar and D.P. Modi, carried out exploration in the valley of upper Indus River and its tributaries with the objective to survey all the rock-engravings located along the ancient routes. In course of exploration fifteen locations with rock-engravings namely Nyoma, Kidmang, Non-Nis, Kiari, Lickche, Alchi, Khalste, Vasudo, Dargo Scirbachan, Achnathang, Dah, Baldias, Bema and Gurukun along the banks of Indus were photo documented. In the Syok valley, one site at Diskit and in the Nubra valley three sites with rock-engravings engravings were recorded at Tirisha, Murginallah and Sasoma. The site at Sasoma which has been discovered during the season, lies at the base of the famous trade route known as Silk Road leading to Yarkand. Most probably the site had served as a camp site for the incoming as well as the outgoing nomads and traders since pre-historic times. The large granite boulders spread over a large terrace have been found engraved with scenes of community dance, hunting, warriors, ibex, yak, horse and tents.

KARNATAKA

19. EXCAVATION AT HAMPI, DISTRICT BELLARY

In continuation of the earlier work *(1997-98,* pp.64, 71-72), the excavation was taken up in the area of nearly 5000 sq m at south-east and west of STR-I near the Octagonal Bath under the direction of D. Jithendra Das, assisted by T.M. Keshava, B.K. Unnithan and M.M. Hadpad of the Bangalore Circle of the Survey.

The excavation carried out in an area of 1200 sq m east of the STR-1 laid bare an outer courtyard built of undressed rubble masonry and also with large-size stone-blocks with mud-mortar and provided with two entrances, one at north-east and the other at south, which are the usual guarded *mahadvaras.* The outermost courtyard thus measures nearly 50m xl8.5m.

North-Eastern *mahadvara* typical to all the entrances encountered in such structures, this entrance was once imposing with *kumuda* moulding with two wings on north and south for guardrooms with a passage for entrance running to a length of 7.70 m and to a width of nearly 2.00 m. Each guardroom measures 7.35mx7.70m and stands to a maximum height of 6.0 m and a minimum height of 0.30 m. It is interesting to note that the northern wing of the entrance rests over a low out crop of granitic boulder.

Southern *mahadvara* found at a slight deviation from the northeastern entrance with an access to the outer courtyard and to a large rectangular southern courtyard. When compared to the north eastern entrance it is smaller in dimension and similarly has guardrooms measuring 11.80 X 4.50 m. There is a passage on either side of the entrance of 2.10 m width. Close to the eastern wing of the above entrance at north was found a sheltered guard-post which is greatly disturbed.

The southern courtyard measures nearly 70 X 15.80 m, abutting the southern inner enclosure wall of Structure-II. This courtyard has two platforms measuring 5.50 X 3.40 m perhaps used for resting.

Nearly an area of 2700 sq m to the west of STR-I was taken up for excavation immediately. The west of western enclosure wall, so far yielded the following structures.

(i) north-south running wall of 70 m length with a

Plates 25-26



25



26

Hampi : 25-26, stucco figurines

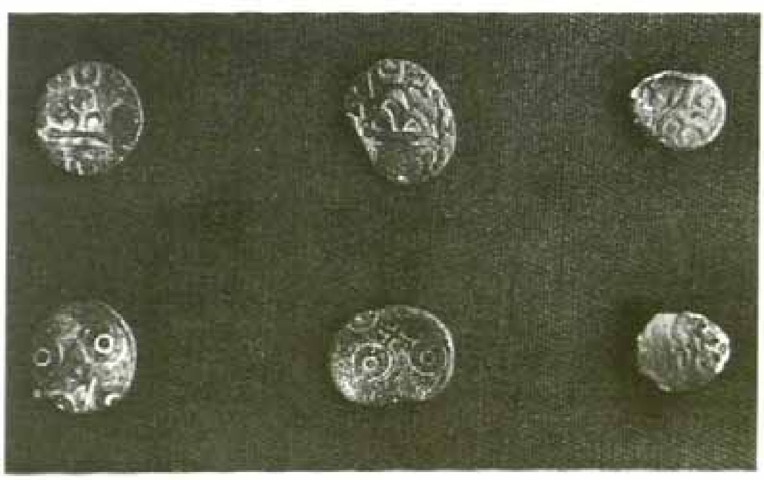
Plates 27-29



27



28



29

Hampi : 27, stucco head; 28, Dambal: image of Parsvanatha and 29, Kanaganahalli: Satavahana lead coins

width of 1.50 m. This wall served as the back wall of a cloister of rooms common to the structural layout of palace architecture.

(ii) 4 m wide passage and another north-south running wall of nearly 40 m length and a width of 1.30 m. This 4 m wide passage at south leads to octagonal bath and at north to another structural-complex, which is yet to be excavated. The extent height of this wall varies from 0.20 to 0.70 m.

(iii) A huge courtyard of 30.80 x 18.60 m with two guarded entrances at north and south were found. The guarded entrances are identical and measure (5.25 X 3.50 m) with the entrance 2.45 m wide. The northern guarded entrance has a right angle screen at south opening into courtyard. The southern guarded entrance, opening towards the octagonal bath just 20m away at south also has equi-measuring platforms (4.10 X 3.10 m) with an entrance. Inside the above courtyard a mortar grinder dislodged from its position has been found indicating perhaps the attempts that were made to rejunnate the destroyed structures after the great battle and destruction.

The excavation to the west of the above courtyard led to the tracing of north-south and east-west running screen walls forming enclosure wall of STR-II.

While excavating the series of walls that form the enclosure wall of STR-II in a passage between two such walls 1.80 m wide, a huge quantity of mutilated stucco figures were found dumped. The stucco figures once decorated the royal terraced platform that was excavated either at their superstructure or might have occupied the entrance gallery. These stuccos of high standard of workmanship show the greatest achievement of the Vijayanagara craftsmen in stucco art. More than a dozen stuccos can be classified into (a) Royal figures or noble men and women (pls.25-26) and (b) secular-figures like pilaster motifs, creeper scrolls, various geometric designs, and plenty of pigeons indicating that they might have been used for *kapota* decorations of the structures. Mention may be made of mutilated male head with typical conical headgear, chubby face, bright open eyes with characteristic downward moustache closely resembling the head of Krishnadevaraya (AD 1508-1530), the famous Vijayanagara king (pl.27); this needs however, further confirmation.

The ceramic representation revolves around the usual grey and red ware which had been encountered in the previous season. The scanty presence of Porcelain, typical to the other areas, is slightly intriguing.

The antiquities encountered are different varieties of nails, pins, dowels in iron and a good number of beads in terracotta, semiprecious stones besides a few encrusted copper coins.

20. EXPLORATIONS IN DISTRICTS BIJAPUR, GADAG, KARWAR AND KOPPAL

The Dharwad Circle of the Survey, while removing lime-wash from the walls of Jumma Masjid, Bijapur, noticed graffitti in Persian, written in black ink. These were left by the pilgrims during their visit to the masjid in the eighteenth century.

During the course of exploration, a Jaina image was found at Dambal (pl. 28). The lower portion of the image bears an inscription in Kannada language and script datable to the twelfth century AD on palaeographic grounds. The inscription refers to the installation of Parsvanatha by Malliyakka, daughter of Devasetti and grand daughter of Kallisetty belonging to the Ekkati family.

Another inscription was also noticed on a stone slab at Kukanur, District Koppal, belonging to the Vijayanagara period (Saka 1506), Friday the fifth day of the dark fortnight of the month *margasira* in the cyclic year *tarana,* which refers to Sadashivaraya of the Vijayanagara dynasty. Other details of the inscription are lost. The inscription was found during the construction of a community center at Kukanur.

One more inscription of the Vijayanagara period was also found at Kinnar in District Karwar. The inscription in thirty lines engraved on both the sides of the stone slab, dated Saka 1304, refers to Harihara-II and his officer Kadiwadada Mallappa. It records the grant of land to the God Suntesvara.

21. EXCAVATION AT ISAMPUR, DISTRICT GULBARGA

In continuation of the previous year's work *(1997-98,* pp. *13-11),* at the Acheulian workshop near Isampur (16° 30' N; 76° 29' E), lying in District Gulbarga, K. Paddayya of the Deccan College Post-graduate and Research Institute, Pune, undertook further fieldwork at this site located in the Isampur sub-valley of the Hunsgi valley. This season's fieldwork comprised excavation, exploration, surface mapping and contour survey. Excavation included the extension of Trench 1 which was excavated in the previous seasons (1997-98). Two new trenches (Nos. 4 and 5) were also taken up for excavation, In addition, four section cuttings were made in the area surrounding the site.

The aim of this season's work was three-fold; a) to reconstruct the palaeo-landscape of the site; b) to ascertain the sedimentary and stratigraphic context of the Stone Age cultural material (Acheulian and Middle Palaeolithic); and c) to obtain a better understanding of the lithic production processes that were adopted by the hominids.

In order to reconstruct the palaeo-landscape, explorations and contour survey of the site area were undertaken. These brought to light a shallow but large palaeo-drainage tract located between an interfluve in the west forming part of the valley floor and the limestone plateau in the east. The ancient drainage tract, on the western margin of which the Acheulian site is located, was carved on the weathered limestone bed-rock due to erosion and measures 1.5 km in length (north-south) and 200-300 m in width (east-west). This drainage tract was a shallow fluve and must have provided a source of water and aquatic food to the Acheulian groups. In post-Acheulian times it was filled up with thick silt deposits.

The four section cuttings dug at various spots in the silt deposit of the palaeo-drainage tract confirmed several of the previous observations regarding site stratigraphy and the nature and origin of sedimentary deposits occurring in the locality, hi three of the section cuttings, Acheulian artefacts were found to occur on the limestone bed-rock in a hard, nodular, carbonate rich matrix. This confirmed the pre-Acheulian age of the palaeo-drainage tract as well as the stratigraphical context of the Acheulian assemblage at the site. The Acheulian horizon was found to be capped by 1 m thick calcareous brown silts which in turn were overlain by black silts. In two of the section cuttings, the upper part of the brown silt deposit yielded Middle Palaeolithic artefacts. Thus for the first time it was possible to establish the stratigraphical context of the Middle Palaeolithic culture of this region. In one of the section cuttings (Cutting I) it was possible to discern that the black silt cover lay unconformably over the brown silts. This indicates that the brown and black silts are two distinct sedimentary bodies. There is evidence of internal stratification within these

two sedimentary bodies as well which shows that several episodes of sedimentation were responsible for their formation.

Three trenches were taken up for excavation during this field season.

Trench 1 which was excavated in previous seasons 1997 (3 m) and 1998 (21 m) was further extended to include an additional area of 36 m. The total trench area measured 6 m in a NE-SW direction and 10 m in a NW-SW direction. For want of time it could only be excavated upto a depth of 45 cm below surface, i.e., the upper part of the Acheulian horizon.

Stratigraphy of Trench 1

Depth below surface	***Sediment/Cultural Feature***
0-10/20 cm	Black sticky clay of recent fluvial origin
20/25-30 cm	Colluvial gravel lens in a matrix of brown silt and made up of angular to sub-angular pieces of Intertrappean chert; some Middle Palaeolithic artefacts.
30-40 cm	Upper portion of the Acheulian level consisting of fresh artefacts, limestone pieces and blocks set in a hard matrix of *kankary* brown silt. This level yielded over four hundred and seventy artefacts.
40-50 cm	Lower portion of Acheulian level, overlying limestone and exposed at two digging levels (45 cm and 50 cm below surface). Over 1020 artefacts were recorded in this level. In the 1999 season, 45 cm level was fully exposed and recorded. The 50 cm level will be exposed in the next field season.

Trenches 4 and 5 lay in the eastern side of the site which is strewn with a large number of limestone blocks. These trenches were excavated to ascertain the existence of the Acheulian level; both these trenches exposed the cultural level in its primary context. Trench 4 measured 4 m (north-south) and 3 m (east-west) and exposed the following stratigraphy:

Stratigraphy of Trench 4

Depth below surface	***Sediment/Cultural Feature***
0-10 cm	Compact black silt with an admixture of brown calcareous silt, with limestone blocks and a small number of chert and limestone artefacts. The level is somewhat disturbed due to soil quarrying.
11 -30 cm	Acheulian horizon in a hard matrix of calcareous brown silt and resting on weathered limestone surface. For purposes of digging and recording this horizon was treated as three vertical levels; 15 cm, 20 cm and 21-30 cm below surface. Altogether over six hundred thirty artefacts of limestone were found in this level.

Trench 5 measured 3 m x 3 m and for want of time, could be excavated upto a depth of 10 cm only.

Stratigraphy of Trench 5

Depth below surface	***Sediment/Cultural Feature***
0-10 cm	Acheulian cultural material (somewhat

disturbed due to soil quarrying) in a matrix of black/brown silt. Over four hundred and fifty artefacts were recorded in this level, hi general these artefacts are slender in size as compared to the material from other trenches and may therefore present a developed tradition within the Acheulian

11 cm & below Excavations to continue

The results of excavation show the cultural material from all these trenches is preserved in its primary or undisturbed depositional context. From these points of view, Isampur occupies a special place in the Lower Palaeolithic record of the sub-continent.

Secondly, the excavation not only confirmed the identification of a Middle Palaeolithic level but also brought to light additional data on the Middle Palaeolithic and Acheulian lithic technology

Thirdly, the evidence from this excavation reinforced the view that the Acheulian level at Isampur represents an extensive quarry-cum-workshop site associated with a weathered natural outcrop of limestone. Here the highly siliceous, 10-15 cm thick blocks of limestone which were available in suitable shapes and sizes were selected by the hominids for the manufacture of stone tools.

The Middle Palaeolithic assemblage from Trench 1 compares well with the Middle Palaeolithic artefacts found elsewhere in the valley in terms of both selection of raw material and typo-technological grounds. Artefacts are fashioned mostly on chert, quartzite and occasionally on limestone. Primary blanks were removed either by simple flaking technique where flakes retain cortex on the dorsal surface or by prepared core technique which produced flakes having regular shapes and fully worked dorsal surface. These flake blanks were subjected to secondary retouching to obtain various scraper forms as well as points and borers.

The excavation as well as surface mapping of the site show that the Acheulian cultural material is very rich both in terms of density and spatial extent. The material is spread over a very large area and consists of several thousand specimens.

This as well as the fact that Trench 5 preserves evidence of a more evolved technology indicated that the site was used for a long period of time for the purpose of stone tool manufacture.

This location served as a quarry-cum-workshop site where the artefact production took place at the raw material source itself. This is attested to by the several features like preponderance of cores and debitage in the assemblage and a relatively low percentage of complete tools; presence of a great variety in the debitage resulting from various stages of reduction sequence and the presence of a large number of hammer-stones. Preliminary studies have allowed to infer the major processes involved in the reduction sequence *viz.,* selection of raw material blanks, preparation of cores by trimming irregular projections on sides and corners of limestone blocks; production of flake blanks; and finally, preparation of shaped tools.

The Acheulian level in Trench 1 yielded a small amount of fossil fauna comprising dental and bone of wild cattle *(Bos sp.),* limb bone fragments of some unidentified medium-sized mammals and shell fragments of the pond turtle (genus Clemmys). This evidence, though limited, is helpful in reconstructing past environments and hominid food habits.

22. EXCAVATION AT KANAGANAHALLI, DISTRICT GULBARGA

In continuation of the work done during the year *(1997-98* , pp. 93-96/ under the direction of D. Jitendra Das, assisted by T.M. Keshava, C.S. Seshadri, Sushanta Kumar Kar, B.K. Unnithan and Meghraj-Hadpad unearthed the constructional pattern of the stupa.

During the present season, the work was concentrated in the study *of medhi* slabs, railings, veneering members and other sculptured architectural members of the fragmented sculptured slabs, after removing the baulks previously exposed. Many architectural members like veneering slabs, upper drum slabs, lower drum slabs were also retrieved.

The core trench laid previously in the centre of the stupa, in search of reliquary, was expanded to know about the core fillings. It has been observed that the core is filled with river pebbles, gravels and boulders. Towards the centre of the core thick layer of ashy earth has been observed in the section. At the inner side of the *medhi* is seen a foundation wall projecting towards the centre and it measures 1.5 m in width. It is constructed in undressed small size stone blocks and some times pebbles with lime mortar. No reliquary was found, even at the depth of 3.5 m, i.e., the natural soil.

A channel trench was taken up to study the relationship and constructional pattern of the stupa and its correlation with the brick structures located outside the perimeter of the railing on the south-east corner. The channel trench cutting across the *pradakshinapatha* with *medhi* on one hand and brick *chaitya* on the other, revealed that the foundation for the great stupa is also laid in limestone slabs of nearly 45-50 cm thick (height), which is off setted to a width of 90 cm. Over which the actual *medhi* raises in two tiers of lower and upper *medhi.* The *Pradakshinapatha* rests over this offset with a cushion of Black cotton soil. It is interesting to note that the uprights of the railing buried to a depth of 50 cm from the *pradakshinapatha* level. The most interesting find outside the railing from this trench is the hoard of nearly twenty coins of various rulers of Satavahana dynasty like Yajnasri-Satakarni and Pulumavi very close to brick apsidal *chaitya* located towards the south-east of the Mahastupa (pi. 29).

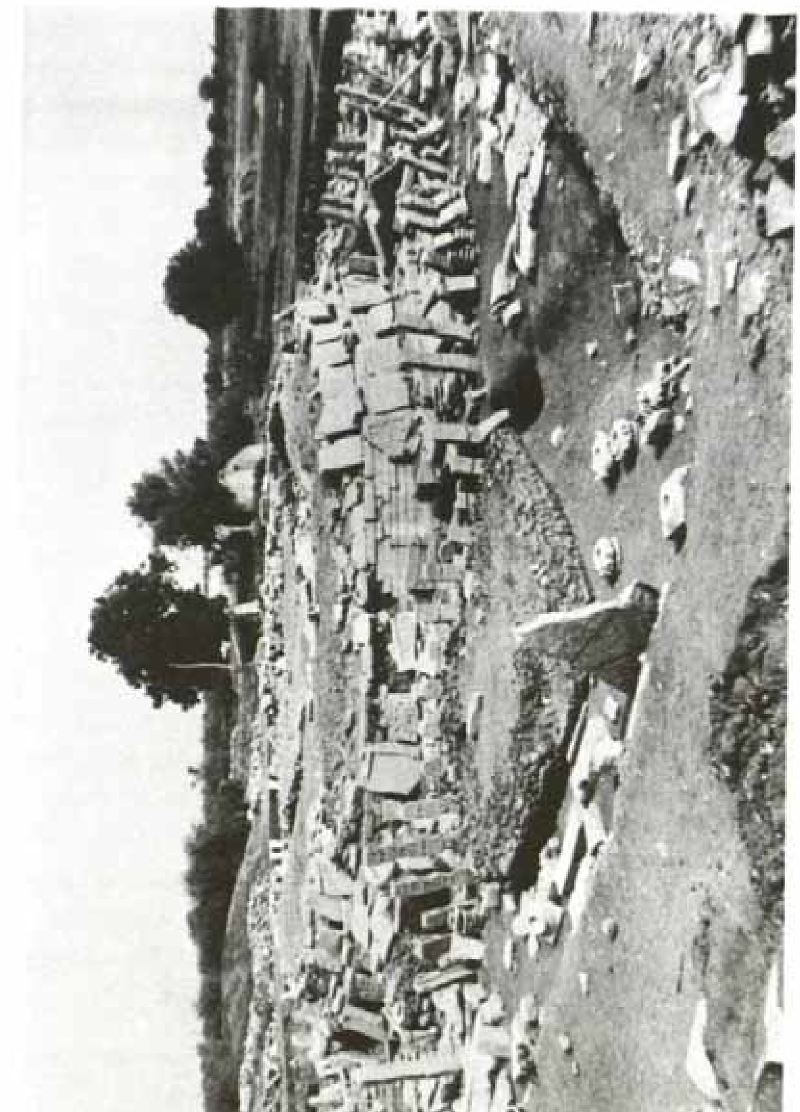
In continuation of the Epigraphical study, it is learnt that, the Mahastupa at Kanaganahalli was patronized by the Satavahana kings and the place attracted devotees, traders, common men, Buddhist monks of various *sanghas* and the great *chaitya* was visited by the people hailing from as far as Himalayars in the north to Simhala (Ceylon) in the south. Perhaps it is for the first time in the Buddhist art of peninsular India that a good number of Satavahana rulers get depicted in the form of life-size panels as part of upper *medhi* veneering like the discourse of religion being held by Simuka and the victorious march of Pulumavi in the street of Ujjain perhaps recording the victory of Satavahana over Ujjain etc.

Several uprights of the railing, broken into more than three fragments, were identified and mended (pi.30). In addition to the uprights, a panel of *raya* Asoka, two *chhatras,* octagonal pillar and *Buddhapadas* which were in fragments were mended in epoxy resin by introducing non-corrosive stainless steel rods of the required size.

23. EXCAVATION AT KOPPAL, DISTRICT KOPPAL

Koppal (15° 21' N; 76° 09' E), situated on the left bank of Hirehalla, a tributary of the Tungabhadra, is on the Guntakal-Hubli Railway line. It is 370 km

Plate 30



Kanaganahalli : uprights of railing before mending

away from Bangalore, and 120 km from Guntakal Junction on the southcentral railway.

The exploration in this area has brought to light many pre-historic and neolithic remains. The stone tools of the neolithic period have pushed back the date to the beginning of the first millenium BC. The place was also important in ancient times as noticed from numerous Prakrit, Sanskrit and Kannada inscriptions. The famous Asokan edicts at Gavimath and Palkigundu are also in Koppal. The place was popular not only for the Bhuddhist edicts but also for Jaina vestiges. At the end of the tenth century AD this place became the Capital of a branch of the Silaharas. Under the Chalukyas of Kalyana this place continued as a notable centre and is referred to in several of their inscriptions. Later it came under Shahji owing allegiance to Adil Shah in Bijapur as a part of his Kanakagiri Jagir.

Further north of Koppal, Asokan edicts were also found at Sannati in District Gulbarga where no evidence of the Mauryan period was traced in the excavation and the NBPW found there, was thought to have been brought by the wandering monks. But unlike Sannati, Koppal is located at a central place from which Brahmagiri, Maski, Nittur and Udegollam are not far. Further, provenance of the edicts of Asoka at Koppal at two different places strengthens the idea that Koppal was an important place with considerable population at the junction of roads leading to Brahmagiri and Maski.

From the inscription found in this region it is clear that the area was regularly administered by Asoka. Further excavations at Brahmagiri reveal a sequence of neolithic and megalithic periods starting from the first millenium BC and that on the basis of contemporaneity the subjects of Asoka were practising megalithic tradition and were literate enough to read the edicts engraved during the course of his reign. But none of the levels were attributed to the Mauryan period.

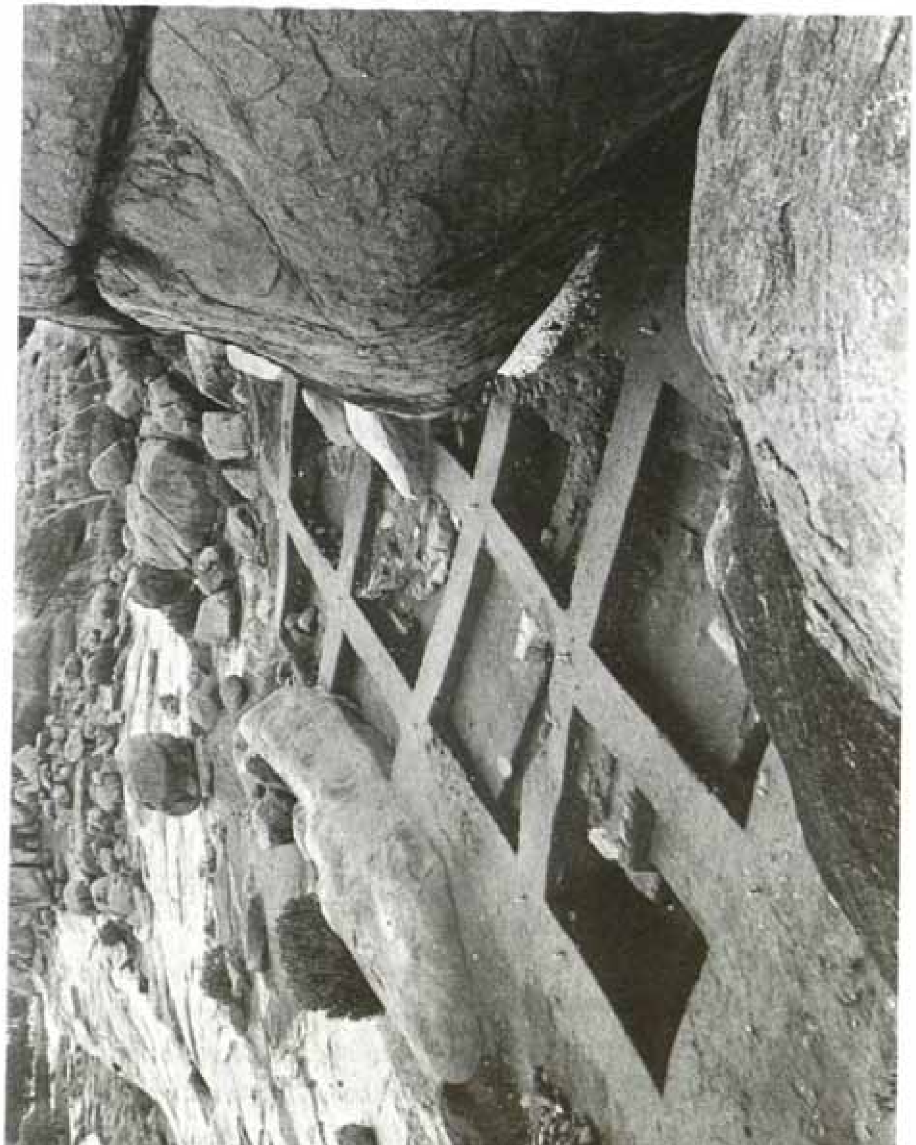
At Koppal the deposit is just by the side of the outcrops of granite near the Gavi Siddesvara Matha on which the inscription in eight lines is carved and it is hoped that the excavation might throw light on the contemporary life. Already much of the deposit was washed away by the torrential waters coming down the hill during the rains exposing pottery and brickbats. The demographic stresses have also contributed for the shrinkage of the site as is evident from the habitation, burial grounds and a crematorium established near the site, both at the fort area as well as the Gavi Siddesvara Matha.

The Dharwad Circle of the Survey, under the direction of K.Veerabhadra Rao, assisted by K. Venkateshwara Rao, M. Kalimuthu, A. V. Naganoor, R.S. Athani, B.N. Byadagi, S. Lingaraj, and S.L.B. Desai, conducted trial-excavation at Koppal (pl. 31) with the main objective of bringing to light the cultural aspects of the society contemporary with the Asokan Edict, and also to establish the stratigraphic context of the pottery found on the surface on the western side of the Asokan Rock Edict at Koppal. The trenches were laid on the western side of the rock in the north-south orientation. The following stratigraphy was observed in excavation.

Layer 1 : Roughly 25 cm thick hard dark brown soil with occasional potsherds.

Layer 2 : 75 cm thick compact layer of gravel with brickbats, potsherds and other cultural material. In this layer itself a brickbat floor and a single course wall were found. Satavahana coins were also found.

Plate 31



Koppal : general view of excavation

Layer 3 : Natural deposits of dark brown compact sandy soil brought down from the higher level.

The trial-trenches laid bare a small rectangular brick structure datable to the Satavahana period. The remains of the structure lying in east-west orientation consists of a single course wall with bricks measuring 40x22x11 (roughly 1:2:4) with the floor consolidated with brickbats and potsherds.

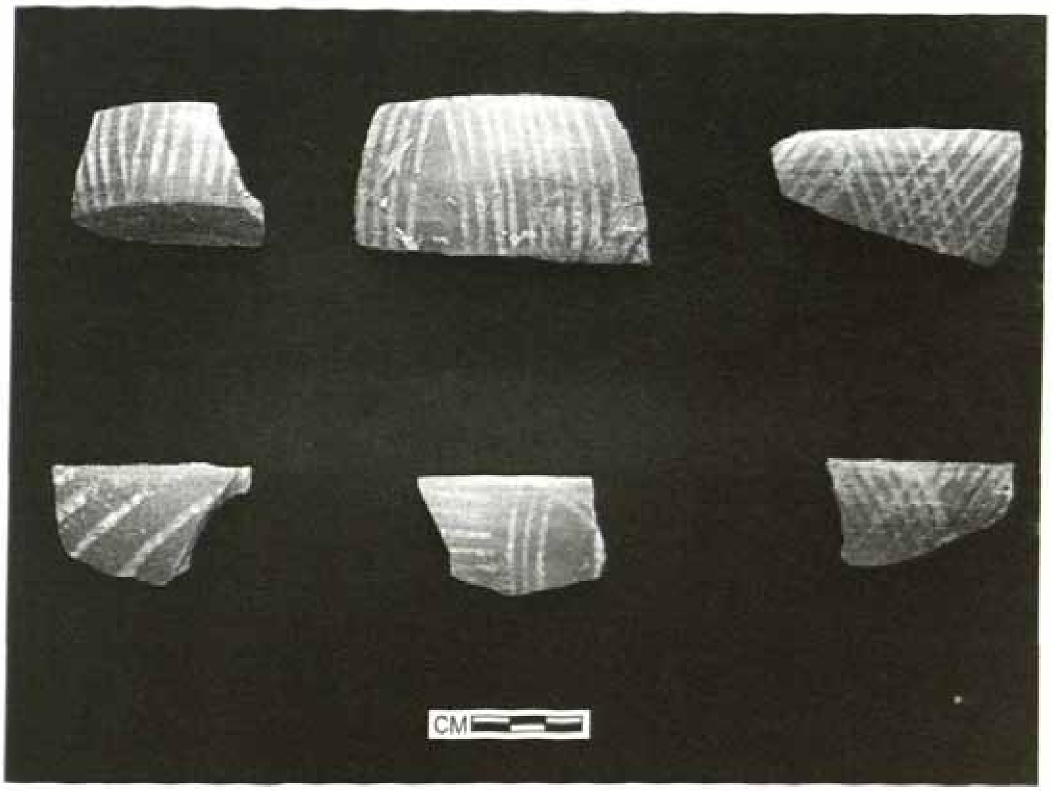
Excavation in the southern side brought to light ancient floor level, made of *murram* derived from decayed granite. The western extension of the trenches brought to light an alignment of stone boulders in the north-south axis to bring the sloping portion of the hill to the horizontal level by filling up the area between the rock, bearing inscription and the stone alignment. This was done during the Satavahana period itself. The provenance of a Satavahana copper coin with an inscription *(ra) (no) (sa) ta kamni* around a three-arched hill on the obverse and Ujjain symbol on the reverse, in the same layer gives a date not later than second century AD. But the availability of black-and-red ware which has a long span extending from the megalithic to the Satavahana period pushes back the date to the pre-Christian era. Further the Mauryan rule has not influenced any pottery types in the south and there is no local pottery specific to the Mauryan period, and the same shapes of the megalithic period can be seen during the Satavahana rule. Under the circumstances the mere absence of NBPW need not imply that the site does not belong to the Mauryan period. The pottery found on the surface was from layer 2 only. It was dumped above the ground for levelling by the local people after cutting pits during the annualya/ra in the month of *Sravana* (August-September).

During the course of excavation, a large quantity of crude dull red ware was found. Grey ware and black-and-red ware were also found. A large number of tiles were also found in a fragmentary state. The dull red ware of medium fabric is mainly represented by conical bowls with flat base which was also predominant at Benagutti, village Sannati, District Gulburga and globular pots with a variety of rims and decoration. Other shapes include basin, storage-jars, conical bowls. The sherds of painted russet coated ware were found mainly at the fort which was a habitational area. No cultural remains datable to Asokan period were found.

In this connection it is most pertinent to state that even though the dynasties and their kings change with time, the tradition and customs of their subjects hardly change and it is unreasonable to expect material cultural remains of the Mauryan period in a remote corner of kingdom at Koppal. On the western rock face of the boulder containing the Asokan inscription, there is a deep horizontal groove cut across the face of the rock indicating that a sloping roof was existing to shelter the monks. The scanty material remains, available here also substantiate the fact that this was not a habitational area and was probably a resting place for the wandering monks during the Vassa period. The majority of the pottery also is represented by broken conical bowls with flat base, which were probably used by the *bhikkhus.*

Another trial-trench (2 X 2 m) was taken up on the eastern side of the Fort at Koppal. Lead coins and painted Russet coated ware (pl. 32) besides some shell bangle pieces and hop-scotches were recovered. Nearby there are also evidences of brick and stone structures. The antiquities include lead coins, bearing the usual Ujjain symbol and shell bangle pieces. The area was heavily disturbed during the construction of the fort in AD 1786, when Tipu Sultan was ruling

Plate 32



Koppal : painted Russet coated sherds

over the territories. The habitational area was cut for providing a moat on the northern side and the excavated earth was dumped near the fort wall. The remaining undisturbed area on the north is being used as a burial ground by the Muslims.

24 EXPLORATION IN DISTRICT MANDYA

Uday Anand Shastry, of the Bangalore Circle of the Survey, during the course of village - to-village survey dicovered the following antiquarian remains in Pandavapura taluk.

Village	Nature of remains
Amruti (12° 38'N; 76° 41'E)	Medieval inscription of thirteenth-fourteenth century AD
Anunahalli (12° 37'N; 76° 41'E)	Medieval sculptures and hero-stones, Lower Palaeolithic stone tools like handaxes and scrapers of quartz and quartzite
Balghatta (12° 41' N; 76° 38' E)	
Bellale (12° 36'N; 76° 40'E)	Late medieval hero-stones Late medieval sculptures
Bolenahalli (12° 37'N; 76° 45'E)	Medieval hero-stones, Lower Palaeolithic stone tools, handaxes and scrapers of quartz and quartzite
Goudagere (12° 38'N; 76° 39'E)	Late medieval sculptures and medieval *sati-stones* Late medieval
Jakkanahalli (12° 39'N; 76° 41'E)	
Kadalagere (12° 40'N; 76° 40'E)	hero-stones Late medieval hero-stones and sculptures Medieval hero-
Kadenahalli (12° 39' N ; 76° 40' E)	stones and sculptures Medieval hero-stones and late medieval
Manikanahalli (12° 37'N; 76° 40'E)	sculptures
Melkote (12° 39'N; 76° 39'E)	Medieval sculptures and two crudely excavated caves of medieval period
Nyamanahalli - (12° 39'N; 76° 41'E)	Medieval and late medieval hero-stones

Village	*Nature of remains*
P.Hosahali (12°41°N;76°39'E)	Medieval inscription
Shambhunahalli (12°38'N;76°43'E)	Medieval inscription and hero-stones
Talekere (12° 43'N; 76° 39'E)	Medieval and late medieval hero-stones

25. EXCAVATION AT KRISHNAPURA, TIRUMUKKUD> L AND NARASIPUU (T. NARASIPUR), DISTRICT MYSORE

Krishnapura, a small village in T.Narasipur taluk in District Mysore, is situated at a distance of about 40 km south-east of Mysore city. The present village of Krishnapura is said to be a rehabilitated village with an antiquity of about hundred and fifty years. The old village was closer to the north bank of River Kaveri. About 2 Vi km south of this village on the north bank of River Kaveri is a mound amidst paddy fields, which is being encroached upon gradually from all the sides. The area of the mound at present is about half an acre and the height is about 3.05m from the surrounding level. Excavation was conducted at Muttalawad by the Department of Archaeology and Museums, Government of Karnataka *(1974-75,* p. 20) Muttalavadi is another nearby village to the mound like Krishnapura. The report by the earlier excavators was found interesting in the light of chronology fixed for the formation of Talakad sand dunes by the present excavator.

To investigate further in this direction a small-scale excavation at the mound was conducted. A suitable place atop the mound was selected and Trench A-l measuring 5 x 5 m was dug. This trench was numbered as KP-I, A-I. A maximum depth of 1.80 m was reached with the natural soil visible at a depth of 3.60 m.

26. EXPLORATION IN DISTRICT ERNAKULAM

A preliminary survey of the area of Pampa river valley was started by documenting ancient structures. At the first phase, the area of Cheranmalai in the western part of District Ernakulam was taken up. In this area between Pampa and Periyar rivers, ancient temple remains datable to the eighteenth century were discovered. The Cheranmalai well known in Sangam Tamil literature, as the ancient Capital of the Adiyamans (Sangam Age) was also explored. Traces of huge fort- wall constructed with laterite block as well as twenty-five wells were discovered in the Cheranmalai forest. Structural remains with ancient flooring of a building were also traced in Thattekkad on the northern bank of the River Periyar.

27. EXCAVATION AT BEKKAL FORT, PALLIKAREV , DISTRICT KASARGOD

In continuation of the previous year's work *(1997-1998,* pp. 96-99), the Thrissur Circle of the

INDIAN ARCHAEOLOGY 1998-99-A REVIEW

Survey, under the direction of T.Satyamurthy, assisted by L.S. Rao, Krishna, T. Samual Joshuva and P. Aravazhi resumed excavation in the northeastern corner of the inner fortification near the Watch Tower (Sector BKLII).

To expose the buried structures, trenches of 10x10 m each were laid out. The remains of imposing Royal Hall (40.22 X 9.5 m) facing south with a raised platform (5.1 X 4.7 m) at the northern end was exposed. The existence of big port-holes near the southern gateway indicate the existence of massive door. The entire hall was laid-with laterite flooring. There are two outer walls (17 m thick) and the area in-between was found to be filled with debris of terracotta tiles, burnt charcoal and ashes indicating some fire to the imposing structure.

Significant discovery was a toilet-block constructed in the ancient Indian style in the north-western corner of the Darbar hall. Huge blocks of granite were used for draining water. The soak pit was scooped in the laterite outcrop and it was deep (more than three meters) to reach natural soil. A well in semicircular plan was also excavated near the toilet-block. The plan of the exposed structure was similar to the halls constructed by Keladi Nayakas of lkkeri datable to the seventeenth century AD. More than six hundred antiquities, mostly the copper objects like nail, ring, were encountered.

28. EXCAVATION AT ROCK-CUT-CAVE, DISTRICT THRISSIUR

P. Sreedharan of the Department of Archaeology, Government of Kerala, carried out excavation at the site.

It is believed that there were about hundred and one Sivalayas existed in Tali locality. These temples maintained links with each other with their uniform religious rituals. The Sivalayas situated very near to the site are Tali Siva Temple, Kadukassery Siva Temple, Vittanathu Siva Temple and Pelakkadu Siva Temple.

Four more *Siva-lingas* were traced during the exploration, One big size *Siva-linga* was found installed on top of a hillock near Kizh Tali.

A flight of steps built around the hillock lead to the *linga* on top. There was no roof or shelter provided to the *linga*. The *lingas* are believed to have been installed at the boundary as the guardian of the society. The megalithis were found on top of a hill comprised in Survey No.270 of Desamangalam Village of Thalappally taluk.

On the eastern side of the hill is a paddy field named Thalassery extending down to a small stream. On the western side, a Siva Temple is located. It extended to a hill named Thachukkunnu which is associated with the legend of Cheramanperual.

Thukkarakkunnu - a hilly place was once used to hang persons punished for crimes. Kuthirakkulam is yet another spot. There was once a pond, the evidence of which could be seen even now. That pond was used to wash the Royal Horses. Next is Kappachalu, a huge channel connected to the river which once carried the boats to the fort in ancient days. It is believed that king Cheramanperumal or a person with royal connection had settled on the hill called Thachukkunnu. As such almost all the places are

in one way or the other connected with the royalty of those days.

Boulders lie spread all over the flat surface of the hilltop. Huge lateritic belts are also seen. Brick cutting was done abundantly as the evidences indicate. Some more megalithic monuments noticed were ruined by the labourers. Two more burial evidences were also noticed in a ruined state. During exploration two other megaliths were also found.

The place Kadukkassery is located on the northeastern side of District Thrissur. The top opening of the rock-cut cave was noticed accidentally while exposing a huge lateritic belt. Before the arrival of experts, damages were caused by the public to the exposed archaeological furnitures. With the discovery of a passage in the northern side of the top opening, digging was taken up which revealed evidence of a flight of steps leading downwards. Steps were seen built beautifully in laterite itself and went down to the fifth step. After the clearance of the main steps, another mini passage, a second passage, fenced with lateritic boundary was noticed. It extended to another flight of steps leading to the mouth of the cave, which was covered with a laterite slab.

Scooping started from the mouth of the cave. Loose soil filled the cave and the level was found uneven. Quadrant method was implemented inside the cave. Some pottery like three-or four-legged jars were found exposed and disturbed through the top opening of the cave. Soil was loose, gravelly and reddish.

An isolated medium-sized pot was noticed on the eastern side of the cave from QD B. Iron implements were found along with the group of pottery. A significant feature of the cave was a huge bench built in laterite itself. The bench measured 180 cm, 170 cm in length and 70 and 90 cm in width.

The Department of Archaeology examined another rock-cut cave at Vellinezhy, Palakkadu district in 1994 and recorded two benches in the rock-cut-cave. They were of smaller size. But both were made of granite, placed at two ends of the cave. Another piece of significant find was the extraordinary pillar bearing the shape of a huge human leg on it. It resembled a leg of a huge umbrella or the leg of a human being, inside the cave looked like an open umbrella. The measurement of the pillar on upper side and lower side was 155 cm in width and 135 cm in length respectively. It was in perfect condition without damages and appear to have been constructed according to certain mathematical principles. The bed-rock is laterite and the tip opening has a lid made of lateritic block.

The pottery types comprised small pot, vase, bowl, lid, lid handle, three-and four-legged jars etc. Some pottery especially the legged-jars that were exposed and visible through the top opening were damaged by people. Pottery was in black or red. But no exceptional type of pottery could be collected from the site.

As far as the iron implements are concerned the same types are available as in case of other megalithic monuments. These are small blade, knife, sword, etc. All implements were seen placed along with the group of pottery.

A comparison of Kadukkassery rock-cut cave and Vellinezhy rock-cut-cave suggests that

both these are highly perfect. Kadukkassery has pillar while Vellinezhy has no pillar. Kadukkassery has single laterite bench while Vellinezhy has two granite benches. Kadukkassery has flight of steps leading downwards. But Vellinezhy has no steps, however, it has a slope to the cave. Vellinezhy has rich collection but the Kadukkassery collections are less in number. Vellinezhy has no lid on passage. It has a sloping way down to the cave. Mathematical perfection appeared to be adopted fully in the Vellinezhy rock-cut cave alone.

The Department of Archaeology, the Government of Kerala, also carried out limited excavation of an urn burial at the site. The urn was found located very near to the rock-cut cave, with an extra feature having twin urn burial. The distance between each urn was 6 cm. At the beginning, two extraordinary pots were noticed. A stone lid was found at the depth of 125 cm. Digging continued simultaneously in Trench A and Trench B. Stone lids were noticed at the same depth. The pots were filled with loose soil having a fragile tendency. The uneven rounded stone leads were removed and examined. Bowls, vessels etc., were seen on both the trenches. But no iron was found from Trench B. A beautiful small sword was collected from Trench A. These burials were that of a male and female. The male burial yielded a sword. No bead or any other item of archaeological importance was reported. Digging and examination continued upto the bed-rock.

It was reported that Mangadu excavation dated back the megaliths to 900 BC through Radio Carbon dating. It had uniformity with almost all other megalithic monuments of Kerala region. All these evidences strongly support the conclusion that the megalithic culture of Kerala region had extended upto the third century AD. So the Kadukkassery rock-cut cave may be also dated to 900 BC.

As far as Kerala region is concerned, the rock-cut caves are included in one of the other type of megaliths. All other monuments, except cist burials are made of laterite, i.e., umbrella stone, capstone, hoodstone and rock-cut caves. All the cist burials are built in granite only. Before the arrival of Dravidian language speaking people to the Kerala coast, the proto-Australoid people who habitated in these areas were the authors of these megalithic monuments, excluding the cist burials. As in the case of other megalithic monuments, these rock-cut caves were also built for their venerable ancestors very carefully, safely and beautifully.

MADHYA PRADESH

29. EXCAVATION AT UBHARIA, DISTRICT BETUL

The Excavation Branch-I, Nagpur, of the Survey, under S.K. Mittra, assisted by N.C. Prakash, Ch. Babjirao, Prabash Sahu, N.K.S. Sharma, H.J. Barapatre, S.K. Gulrandhe, D.K. Kasbi, R.G. Nagulwar, S.M. Khairkar, A.E. Keshwar, D.A. Kamble, Shahid Aktar, S.A. Raut, M.M. Dahake, M.R. Kambe and R.G. Patil, conducted excavation at Ubharia (21 ° 48' N ; 78° 09' E). Nearly hundred megaliths were located at the site which represent basically two types *viz.,* Type I : Cairn heap circles and Type II: Pit circles.

Megalith Type I constitutes the majority while Type II accounts for nearly a dozen. All these

megaliths are concentrated on either side of the State Highway within an area of about half a sq km (fig. 17; pl. 33). Unfortunately, no habitation mound could be located in the immediate vicinity. However, a number of pre-historic and early historical sites explored, failed to give any direct evidence of these being related to the megalithic site of Ubharia.

In megalithic Type I (Cairn heap circles), the megalithic builders dug a pit essentially in east-west orientation, rectangular in shape, with depth varying from 0.75 m to 2.5 m. The pit was dug through the disintegrated bed-rock and after reaching the desired depth, the funerary goods were deposited in the pit (fig. 18; pls. 34-35). Subsequently, the pit was filled with excavated materials and medium-sized boulders of irregular shapes. Finally, the mouth of the pit was covered by arranging boulders of various shapes and sizes and covered with heaps of basalt boulders available in the region. At the end, the megalith is finally covered with cairn packing, raised at the centre upto a maximum height of 1.5 m from the surrounding plains. Characteristically Ubharia megaliths are devoid of any big boulders normally arranged along the periphery in a megalithic context.

In all, ten megaliths of Type I category were subjected to scientific excavation, which revealed basically uniform characteristics among them in their mode of construction. Surprisingly, three of the smaller megaliths did not yield any funerary goods and hence can be defined as memorials (symbolic) in nature. While the skeletal remains were totally absent in rest of the megaliths, couple of funerary goods placed inside the pit confirm the characteristics of these monuments.

The funerary goods constitute a broken copper bowl with a lid, iron chisels, engraver and wood plainer used by carpenters. Besides dull red ware, medium-sized basin, pear-shaped medium-sized red ware pot and wheels made out of potsherd account for the burial goods. The pottery which is worn off considerably, include coarse fabric with heavy bottom and ill-fired, bearing uneven slip. In one case, the thick bottom with scratch mark inside the pot shows that perhaps the burial pot was partly hand-made instead of fully wheel-turned.

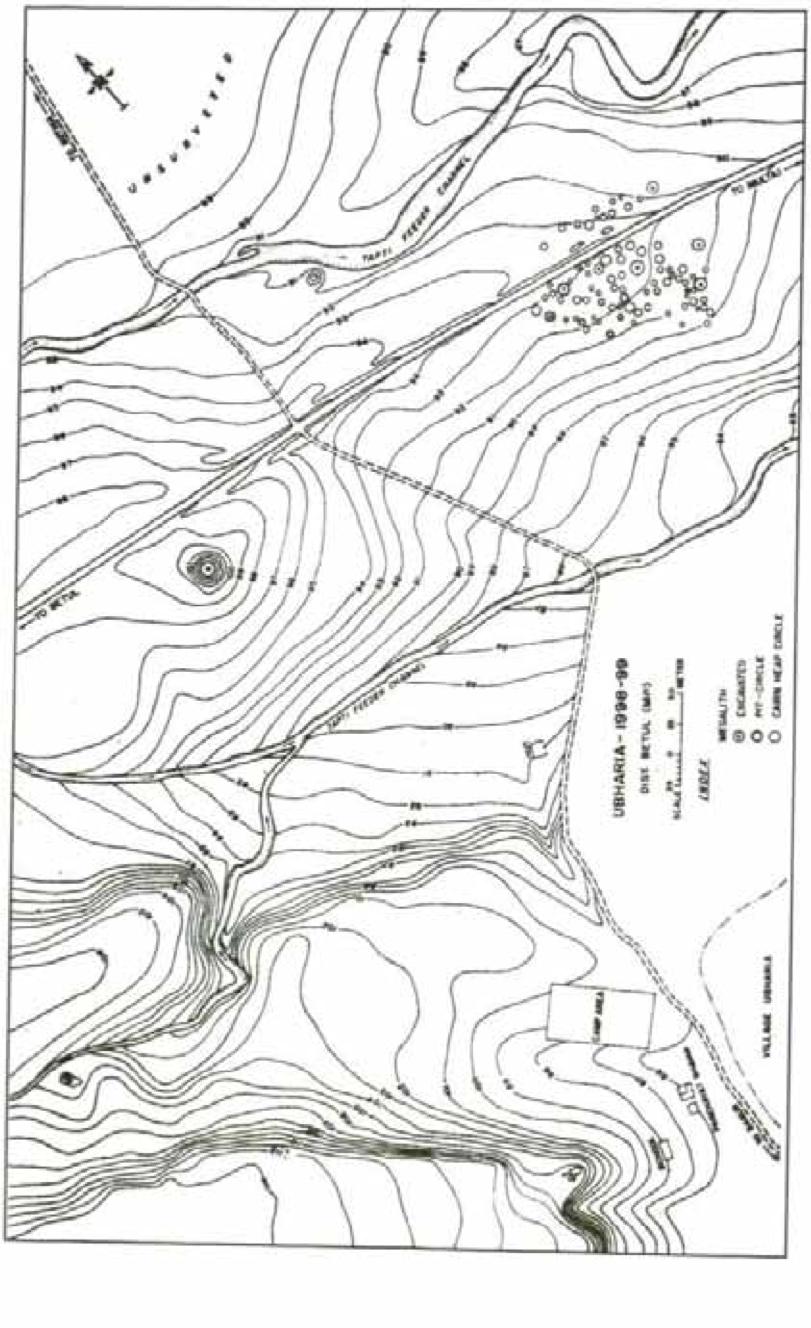
Three pit-circles Megalith Type II (fig. 19) were subjected to scientific excavation which showed close similarity amongst themselves in so far as the construction of the megalithic monument is concerned. The authors of these megaliths have dug a narrow, rectangular, shallow-to-deep pit and deposited the funerary goods inside it. Thereafter, the pit was filled with excavated pit material mixed with black cotton and sandy soil. A row of small basaltic boulders were found arranged around the pit, measuring from 6 to 10 m in dia. Finally, outside the cairn circle, cairn packing was arranged in a single course further upto a distance of a metre all around the circle.

In this category too, no skeletal remains were noticed. The funerary goods constitute iron wood plainer and engraver used by carpenters and a pear-shaped small *lota* in dull red ware.

30. Exploration in District Betul

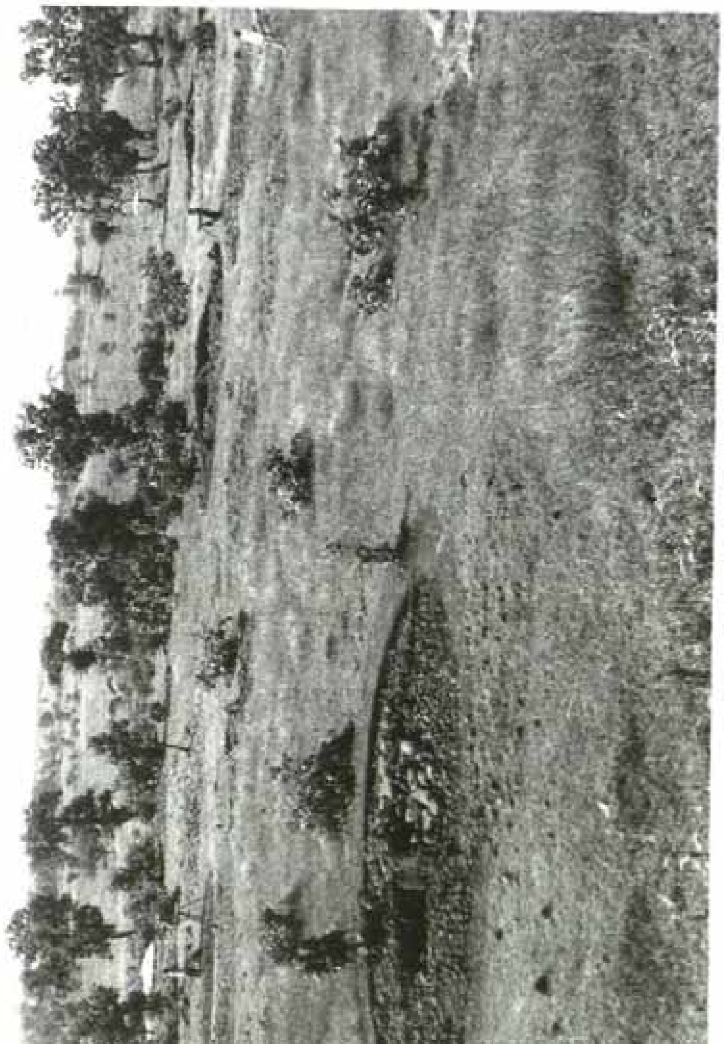
The Prehistory Branch, Nagpur, of the Survey, under the direction of S.K. Mittra, assisted by V.Shivananda, Nandini Bhattacharya Sahu, K.M. Girhe, R.K. Dwivedi, N.K. Nimje, Ghyasuddin, PS. Pashine, A.P. Gadekar, M.S. Kadhao and K.D. Chutele carried out exploration in the Multai tehsil and reported the following sites.

Fig. 17



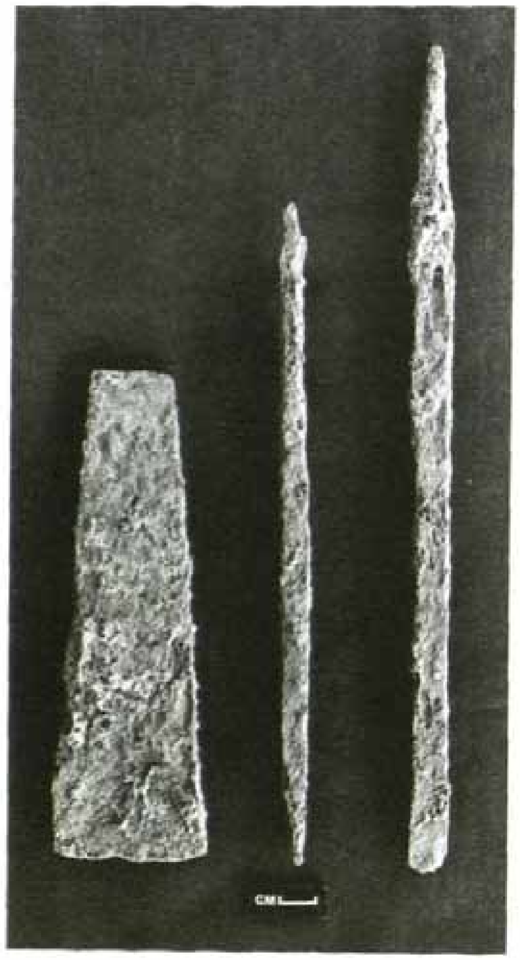
Ubharia : contour and location of megaliths

Plate 33



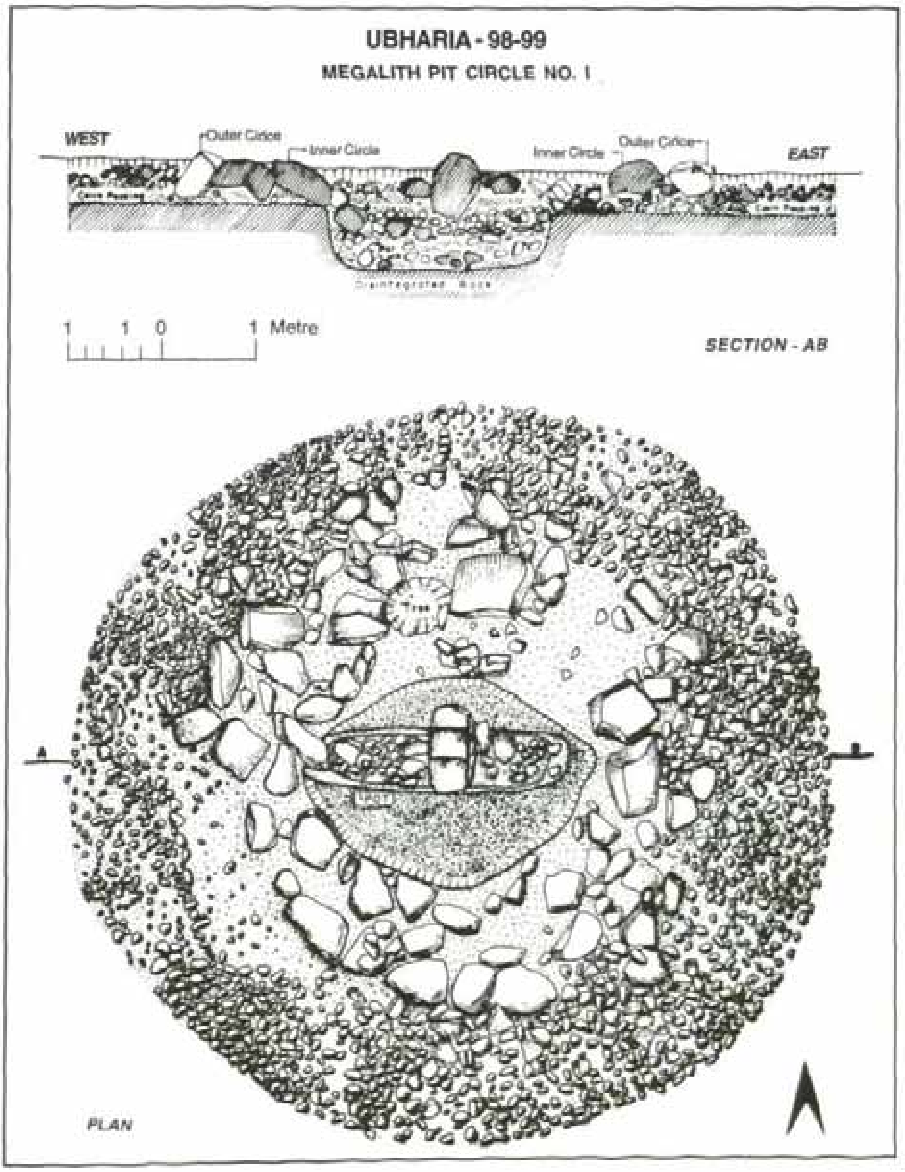
Ubharia : general view of megalithic site

Plate 35



Ubharia : iron objects from megalith CH1 (wood plainer and chisels)

Fig. 19



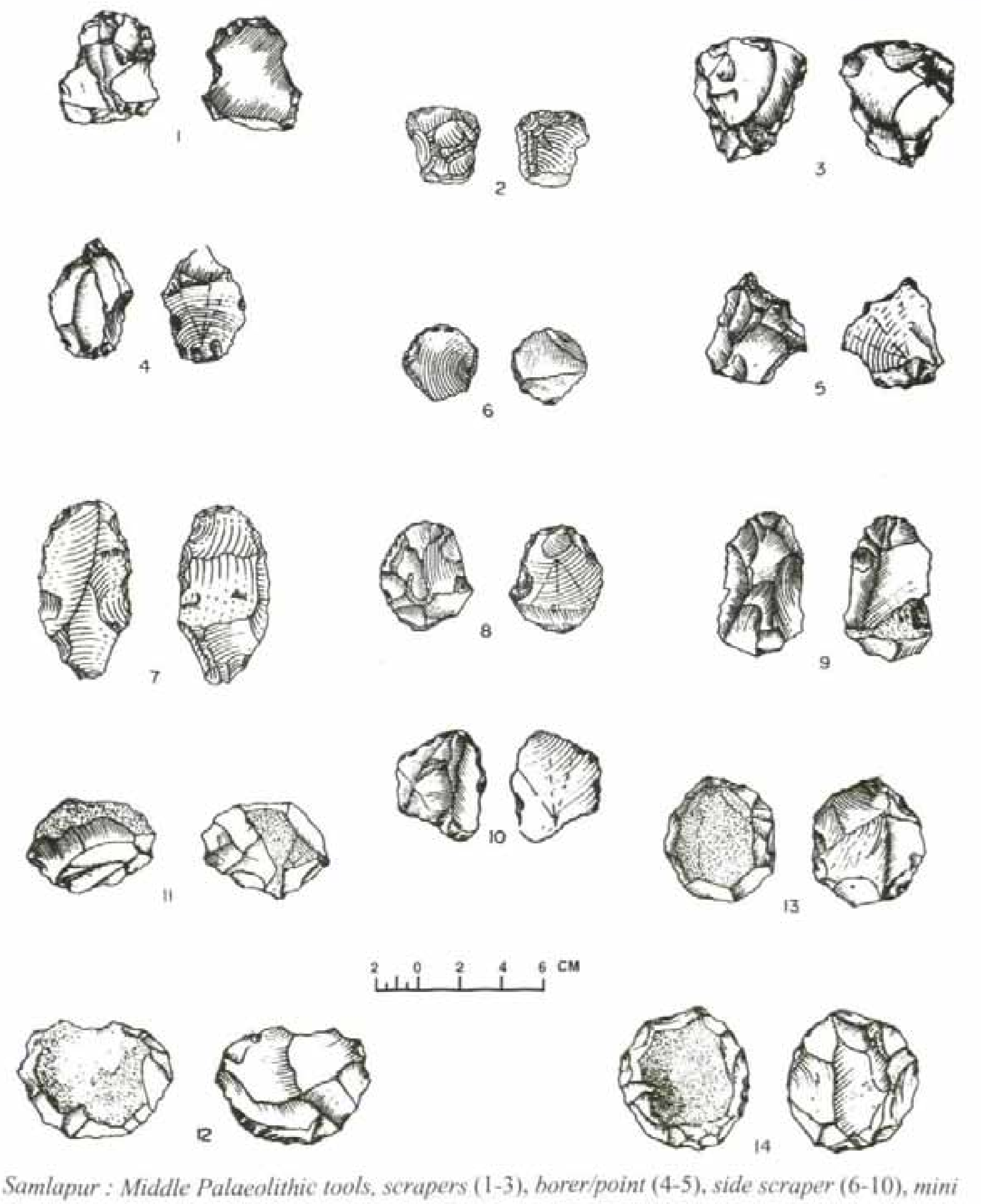
Ubharia : pit-circle (1)

Village	*Nature of remains*
Amadoh (78° 12'; 21° 49')	Megalithic
Bhutaikheri (78° 6'; 21° 51')	Late medieval
Humanpeth (78° 7'; 21° 48')	Middle Palaeoliths and microliths
Jamthi (78° 3'; 21° 52')	Historical
Junapani (78° 11'; 21° 49')	Megalithic
Khapa (78° 9'; 21° 49')	Middle Palaeoliths
Mohi (78° 14'; 21° 04')	Historical
Nagarkot (Dagadkot) (78° 14'; 21° 49')	Late medieval
Nagthana (78° 7; 21° 48')	Historical
Samlapur (78° 9'; 21° 52')	Middle Palaeoliths
Ubharia (78° 9'; 21° 48')	Mesolithic

The most prolific site during the course of exploration was noticed that of Samlapur situated approximately a kilometre east of State Highway No. 27 opposite the village Ubharia, situated 16 km on Multai-Betul Highway : The Middle Palaeolithic (figs.20-21) and the Upper overlooking an ancient natural tank. The prehistoric artefacts are spread over an area of more than half a kilometre in length over the plateau and nearly 200 metres in width.

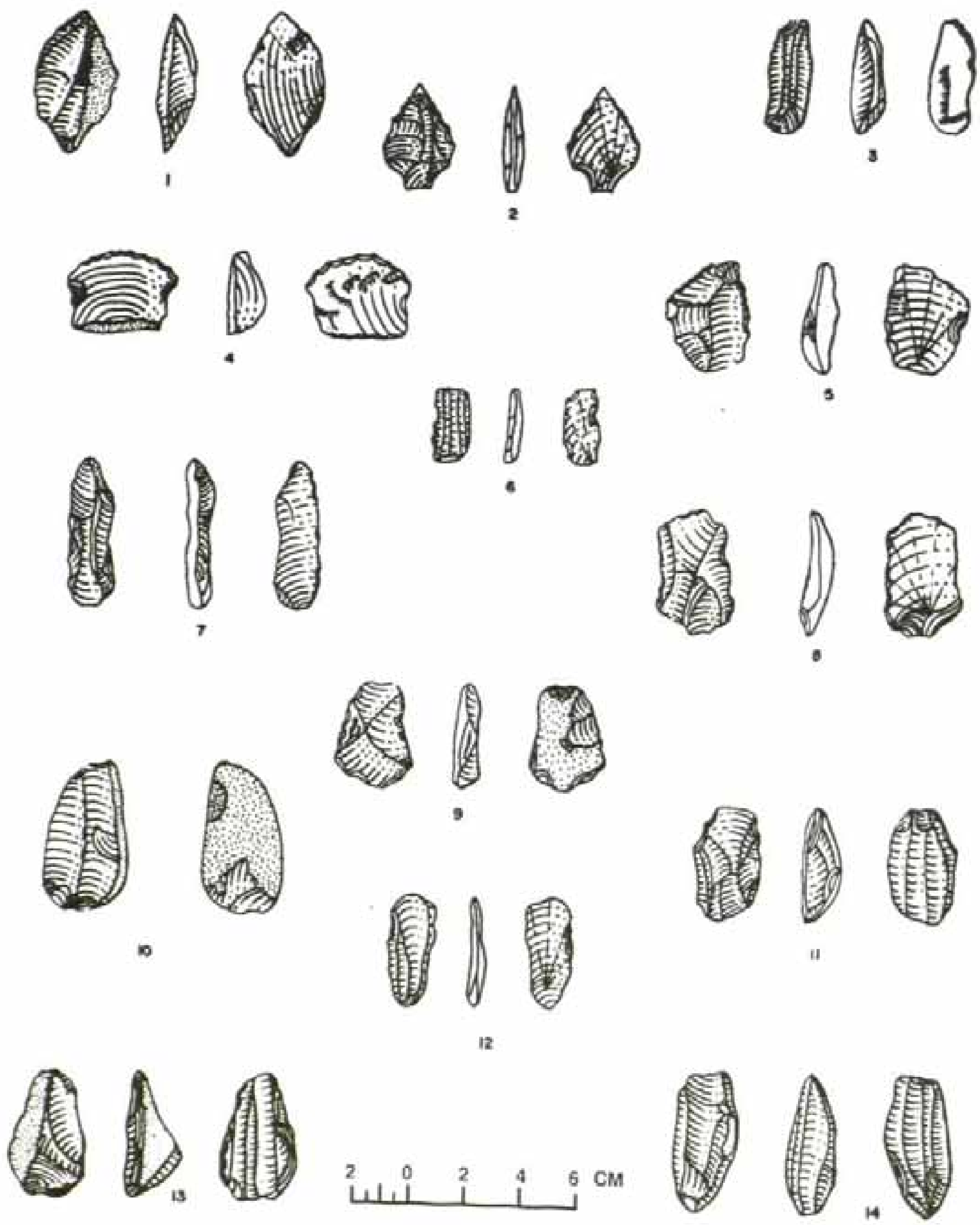
A special mention is made here of the find of a chalcedony tanged arrow-head from Ubharia.

Fig. 20



Samlapur : Middle Palaeolithic tools, scrapers (1-3), *borer/point* (4-5), *side scraper* (6-10), *mini chopper-chopping* (11-12) *and discoids* (13-14)

Fig. 21



Samlapur : Upper Palaeolithic point (1&3), *end scraper* (4–5), *side scraper* (6-9), *fluted core* (10-14), *and Ubharia : tanged arrow-head* (2)

31. EXCAVATION AT KHAJURAHO, DISTRICT CHHATARPUR

Bhopal Circle of the Survey, under the direction of P. K. Mishra, assisted by N. Taher, Mannuel Joseph, Jagdish Prasad, K.K. Rai, Ramesh Thakur, O.B. Khobragade and R.K. Saxena resumed excavation at Khajuraho on Bijamandal mound near Jatkara village. Part of the southern facade of the temple remains was exposed. The extant remains show complete mouldings of an evolved temple at lower levels. The lowest courses are, however, of roughly chiselled stone perhaps being made to remain underneath. Above these, *bhitta, jadyakumbha, karnika* and *kumbha* mouldings etc., were identified. The topmost mouldings are of *adhishthana* levels only. The plan is also traceable including *garbhagriha, maha-mandapa* and *mandapa.* A brick structure is seen near *arddha-mandapa.*

32. EXPLORATION IN DISTRICT CHHATARPUR

The exploration was conducted by the Hari Singh Gaur University, Sagar, under the direction of S.K. Bajpai, assisted by A.L. Pathak and Pradeep Shukla, in District Chhatarpur.

As time and resources were limited, only the northern part of the district could be surveyed. Various important sites and monuments were covered during the survey *viz.,* Tindni, Jagatsagar, Barat Saredi, Doni Pali, Achat, Gora, Chhatarpur, Matguwan, Chauka, Daharra, Byas Bhadaura, Banjari, Kharrauhi, Kadwahan and Bhimkunda.

The temple of Tindni is facing east. With its ground plan consists of the cella, vestibule, *mandapa* and the entrance. The cella is square-shaped. Only the foundation of the cella is visible. Its upper part is damaged. The vestibule has pilasters on each side. The larger *mandapa* has an additional lateral transepts with balconied windows on the north and the south sides for the ventilation of the interior. The upper part of the *mandapa* has spire, curvilinear in design, but in ruined condition. It is wholly constructed of granite. Architecturally it belongs to *circa* ninth-tenth centuries AD.

At Jagat Sagar lies a Yogini Temple made of coarse granite. It is an open-air square structure of several shrines of which most are damaged. Besides the Yogini Temple, a temple made of granite is erected facing east with a square sanctum,the inner part of which is plain. The door-jamb contains the figures of Ganga and Yamuna. The elevation of the temple includes *adhishthana, jangha* and *sikhara.* The temple is *pancharatha* on plan. Both the temples of Jagat Sagar may be dated to *circa* ninth-tenth centuries AD.

A temple belonging to *circa* eleventh-twelfth centuries AD is erected at Barat Saredi. The temple is facing east with the ground plan consisting of a cella, *mandapa* and an entrance. The sanctum is completely lost, only its foundation and a Siva-linga in the centre have survived. However, the door-jamb of sanctum is preserved. It has *trisakha-dvara* along with the sculptures of attendants and river goddesses, Ganga and Yamuna, on the lower part. The middle of the lintel has the figure of Ganesa. The interior of the *mandapa* has lateral transept with balconied windows on north and south sides. On its centre there is a square-shaped four-pillared architrave. The *mandapa* is connected by an oblong passage to the entrance porch. Originally the exterior part of the temple would have been enshrined with the subsidiary *sikharas* on the entrance porch, *mandapa* and sanctum and the *sikhara,* however, are broken now.

At Doni, three ancient temples are lying on the side of a big tank. Among them, two temples are

facing eastwards, while the third one faces north. The first temple has the entrance porch and the sanctum. The second temple comprises only a *garbhagriha.* The upper part of the *sikhara* is damaged. While the third temple consists of cella, *mandapa, arddha-mandapa* and the entrance. The top of the sanctum has a curvilinear *sikhara.* These temples may be dated to *circa* eleventh century AD.

The villages of Pali, Achat, Cora, Matguwan, Kharrauhi and Kadwahan have an important collection of sculptures. The sculptures are datable between ninth and twelfth centuries AD. Some sculptures are very rare from the point of view of iconography. The sculptures found scattered in the village are lying in the debris of a temple.

The Sun Temple of Chhatarpur, erected on a large platform is *pancharatha* with its entrance facing east. Its ground plan includes *garbhagriha* and *mandapa.* The cella is enshrined with a standing figure of Surya. However, the middle part of the lintel in the doorway has the figure of Ganesa. It shows that originally this was a Saiva temple, and the figure of Surya was kept in *garbhagriha* later on. The *sikhara* of the temple is broken. The temple belongs to *circa* ninth-tenth centuries AD.

The temple of Chauka is also *pancharatha* type, facing east. The temple is built of stone upto *the jangha* with a brick *sikhara* above. The sanctum is square-shaped. A broken *Siva-linga,* is preserved there. In front of the *garbhagriha,* is an open flat- roofed *mandapa* supported by four pillars. The temple may be dated to *circa* eighth-ninth centuries AD.

At present five temples exist at Byas Bhadaura in a group. Two temples standing side-by-side on a common high platform, are very important. These temples have a ground plan comprising *garbhagriha.* *mandapa* and the entrance. The inner part of the *garbhagriha* is square while the *mandapa* is octagonal. The temples are completely made of granite stone, only the doorways of' the *garbhagriha* are of sandstone. The door-jambs are well decorated with sculptures. The middle of the lintel has the figure of *Arddhanarisvara.* Although the lofty *sikhara* of the two temples are visible but the subsidiary *sikharas* of *maha-mandapa* are in ruined condition. All the temples of Byas Bhadaura are datable to *circa* tenth-eleventh centuries AD.

The village Banjari has two ancient temples. The first one - a Gupta temple belonging to *circa* sixth century AD, is flat-roofed. Its entrance doorway has *trisakhas.* The figures of river goddesses standing on their *vahanas* are carved on the lower parts of the door-jambs. The other temple erected at some distance is of sandstone. The temple is of *saptaratha* type, facing eastwards and dedicated to sun. While the *mandapa* is in ruins, the *garbhagriha* still survives. The entrance doorway of the *garbhagriha* is fully decorated. In the middle of the lintel a figure of Surya is depicted. The ruins of the *mandapa* and its entrance door are scattered there in the form of debris. The *sikhara* is completely lost. The temple is dated to *circa* tenth century AD.

Near Dhubela Museum a *pancharatha* Siva temple stands on a small hillock. The temple consists of a square sanctum and above there is a pyramidal *sikhara.* It belongs to *circa* ninth century.

33. EXCAVATION AT GHODAMADA, DISTRICT DINDORI

The Department of Ancient Indian History, Culture and Archaeology of Dr. Harisingh Gaur University, Sagar, conducted excavations at a huge cave known as Ghodamada (23° 60' N; 82° 42' E),

under the direction of V.D. Jha, assisted by Nagesh Dubey, Alok Shrotriya, K.K. Tripathi, P.K. Shukla and N.S.Negi.

The cave covers an area of 82 X 30 m. As the soil deposition joins the roof in the remaining area, further extension of the cave is yet to be determined. It is located at the junction of two high hills covered with dense forest. Two streamlets, rising from the hills, flow in the area. Rivers Narmada and Silgi flow at a distance of 3 km respectively from the cave. Blocks of chert and quartz are found in the locality. Ecologically, it was an ideal area for supporting hunting-gathering community.

The cave facing south has two mouths. The larger one on the eastern end is 26 m wide and 3.35 to 3.50 m high. Another mouth is on the western corner. It seems that the portion between the two mouths was also initially open. Presently it is covered by the fallen rocks.

Two Trenches GDM 1 and 2 were taken up. GDM 1, measuring 6 X 6 m was laid down on the eastern corner near the mouth, whereas GDM 2 (20 X 5 m) was taken in the central part. The cave contains 2.05 m thick habitational deposit over the bed-rock. About 25 m thick top soil yielded mixed antiquities. Two cultural periods e.g., Upper Palaeolithic and Mesolithic were recognized.

The period is characterized by finished, unfinished implements and waste products of stone, bone and antler. The 65 m thick soil deposit yielded burin, blade, scraper, chisel, arrow tip, tanged spear-head, core, scraper-cum-handaxe, blade-cum-burin, fabricator and hammer-stone on chert, flint, quartz, fine quartzite, jasper and dolerite dykes. The tools on bone and antler include scraper-cum-point and scraper-like implement.

A floor prepared by arranging undressed roundish stones was encountered in the lowermost strata in GDM 1. The greenish soil in the stratum gives testimony to the water logging. The floor was prepared to raise the working level.

Period II is recognized primarily on the basis of stone tools. The cultural material unearthed from 70 m thick deposit comprised knife, awl, scraper and arrow tip on bone and antler hammer-stone, engraver, scraper, arrow tip, knife fabricator, chisel, trapeze and hammer-cum-cutter on chalcedony, chert, jasper, quartz and agate. Waste products of bone, antler and stone were also recovered.

The intermediary stratum, i.e., 4—which lies between the Upper Palaeolithic and Mesolithic phases, yielded maximum number of antiquities of both the cultures. It clearly exhibits the continuation of Upper Palaeolithic tradition in the Mesolithic period. Among the notable finds recovered from this 45 m thick stratum are butcher's knife, bone tool (measuring 14.3 X 0.4 cm), awl, scraper and knife on bone, tortoise shaped scraper, long knife, scraper-cum-cutter on antler and a curious tool made on hollowed antler. A beak-like pointed and extremely sharp-sturdy working edge is prepared on one end of this tool. It worked as engraver. Another end is prepared to serve as knife. Saw-like scraper, hammer-cum-cleaver, tanged arrow tip, burin and blades on stone were also noticed in this stratum.

Very few Middle Palaeolithic tools encountered in Upper Palaeolithic strata indicate that the locality was occupied by the Middle Palaeolithic people also. However, no separate strata of Middle Palaeolithic period was noticed.

34. EXPLORATION IN DISTRICT JABALPUR

G.L. Badam of the Deccan College Post-graduate and Research Institute, Pune, conducted exploration in various parts of Madhya Pradesh to study some of the sites for further research, documentation and photography before the final work of preparing report would be started. It may be mentioned that some of the sites visited in the present exploration were Hathnora, Kiriaghat and Hoshangabad. A few of these sites have already been studied in detail earlier. This was, therefore, a final checkup as part of a project on the understanding of preservation of the bone assemblages from the Narmada Valley, and its implications on palaeo-ecological conditions that prevailed during the Middle to Late Pleistocene times.

Explorations were conducted at Hathnora on the right bank of the River Narmada, about 45 km N-E of Hoshangabad. It may be recalled that the site Hathnora gained international recognition because of the discovery of a partial cranium of *Homo erectus* made by the officers of the Geological Survey of India. It has become imperative, therefore, to visit this site time and again, to try and collect faunal material, if not necessarily of hominids, but of the animals many of which preserve signatures reflecting man-animal relationship in the past. Fossils of *Bos namadicus, Antilope cervicapra, Equus namadicus, Sus sp.,* and *Trionyx sp.,* were collected from the gravel bed earlier designated as Unit II of the hominid bearing section. A number of Middle Palaeolithic artefacts, molluscan shells (gastropods and lamellibranchs) were also collected from the section.

A general survey of the area, both upstream and downstream of Hathnora reveals that two cycles of deposition are preserved here in a thickness of about 15 m, both starting with a sandy pebbly gravel with an upward sequence and culminating in the Mid-Holocene Black Cotton Soil.

At Kiriaghat, about 20 km south-west of Hathnora, on the left bank of the Narmada, the gravels are overlain by a thick sequence of yellow-red silty clay which has preserved a good number of fossils. A skull of *Equus namadicus* was completely embedded within a huge boulder and hence could not be extracted. Fossils of *Bos, Elephas* and some unidentifiable fragments were collected from these exposures. It may be recalled that in an earlier exploration a complete skull of *Hexaprotodon palaeinidicus* and limb bones and astragali of other mammals were collected from these beds. Because of the frequent shifting and flooding of the river, lot of fluvial activity is reflected on the fossils in the form of abrasion. It may be mentioned that the skull of Hippopotamus collected earlier is the first and only record of a complete skull of the animal from the Narmada Valley so far, though a large number of other osteological parts of both species *(H. namadicus* and *H.palaeindicus)* have been collected in abundance.

The material collected during the last field work is being studied and the final write up incorporating the results on all the earlier researches is being finalized for a complete report on the Narmada project.

35. EXPLORATION IN DISTRICTS DINDORI AND SEONI

Exploration in Dindori and Seoni districts were carried out by the Department of Ancient Indian History, Culture and Archaeology of the Dr. H.S. Gaur University, Sagar, under the direction of V.D. Jha, assisted by K.K. Tripathi and R.K. Shukla.

The Lower Palaeolithic factory site noticed near

River Silgi, located at a distance of 2 km from Bargaon, yielded both finished and unfinished implements, waste products, large chunks and blocks. Tools have been collected from Chandpur also. The tools comprised handaxe, scraper, cleaver, discoid, chopper and chopping fashioned on sandstone, chert and quartzite.

Bargaon and Chandpur yielded Middle Palaeolithic implements. Cortexed tools, large chunks, blocks and unfinished tools collected along with finished artefacts suggest that Chandpur served as factory site. Chisel, scraper, handaxe-cum-scraper, hammer-stone and core on flint and chert form the assemblage of tools.

Out of the twelve sites, only Nigwani and Karigaderi-Tikratol present the evidence of seasonal camp. The site at Nigwani is located around a sand-dune. Other sites are Gwara, Jhinjhani, Sharda Mandir locality near Shahapura, Khajari, Padaria, Chandpur, Kanchanpur, Bharwa, Barga, Mohgaon, Bargaon and Anarkhera. Tools including burin-blade, tortoise core, point, chisel, fabricator, hammer-stone, arrow-head and scraper made on chert, fine quartzite, quartz, flint, agate and jasper were encountered.

The relics of medieval art were discovered at Pahadikhera and Malpur. The icons of *'garudasina* Lakshmi-Narayana, Uma-Mahesvara, three-headed Brahma and Kubera at Pahadikhera are assignable to the tenth-eleventh century AD. At Malpur, on the confluence of Rivers Narmada and Kanai, late medieval temples and sculptures were traced.

The Seoni district (21° 36' N ; 22° 57' N and 79° 12' E ; 80° 17' E) is situated on the north-south section of the Satpura plateau in the northern part of Jabalpur.

Explorations in part of Seoni district brought to light Palaeolithic and Mesolithic sites, medieval shrines, sculptures, fort and early medieval site.

The only Lower Palaeolithic seasonal camp Chikhlatola noticed so far, is located near a streamlet from where blocks, chunks and unfinished tools in addition to scrapers, small choppers and hammer-stone have been collected. Sandstone, chert and flint were used as raw material. The Middle and Stone Age artefacts noticed in the locality suggest that it was occupied for a pretty long period. Middle Palaeolithic scraper, blade, point, arrow-head, core, hammer-stone and chunks of flint, dolerite and chert have been collected at Hiranbhata, a factory site. Other sites are Chikhlatola and Sunidongari.

Number of Upper Palaeolithic sites is greater. Base camp sites at Chikhlatola and Malkhera, seasonal camp sites at Pahali-selua, Baglai and Madhai were discovered. Tighara, Sahajapuri, Nagjhar, Dandisarai, Sunidongari, Dhenki, Badawani, Sahasana, Hiranbhata, Tikari Bamhni, Harrai and Sihora yielded core, flake, arrow-head and a few composite artefacts. The raw material include chert, jasper, flint, fine quartzite and quartz.

Some Mesolithic sites were discovered at Sahajpur, Sunidongari, Pahadiselua, Sahsana and Madhai. The former one is a factory site. Blade, core, scraper, point and arrow-head made on quartz, jasper, chert and fine quartzite are the common implements.

The medieval sculptures were also discovered at Ghunsaure village, Bisapur. Bhajia, Sarandi, Dondiwada, Dighori, Jevnara, Ugali, Chidchida, Sihora Lakhnadon and Seoni town. The Yoga-Narayana images at Bhajia, Lakhnadon and Seoni Museum, *garudasina* Lakshmi-Narayana at Chidchida, mother goddess at Khermai locality

Lakhnadon, *Salabhanjika,* Hari-Hara and Indra in the Museum at Seoni are among the notable icons. Tirthankara images were noticed at Lakhnadon, Seoni town and village Ghunsaur. Remnants of temples encountered at Sarandi, Chidchida, Dondiwada, Bisapur, Ghunsaur villages, Bhaja, Marh Mandir locality, Seoni town and Khermai locality, Lakhnadon. There are two shrines of twelfth century AD at Ugali.

A hill fort of eleventh-twelfth century AD has been discovered near village Bisapur which is located at a distance of 10 km from Katangi (District Balaghat) on Seoni Road on the southeastern border of Seoni. A *kachcha* road of 3 km from Katangi on Seoni Road leads to Bisapur fort. Built on 130 m high hill, the fort extends in an area of about 01 sq km. A 06 m wide staircase containing seventeen steps leads to the entrance gate facing west. The staircase is protected by a 03 m high stone wall from both the sides. There were guard-rooms on each side of the gate. The second gate, following the main gate was erected at a distance of 45 m. Apart from the stone fortification wall, the plinth of residential buildings is 32 X 24 X 8 cm. Several icons and remnants of temples were found in and around the fort

Mounds containing early medieval ceramics and beads, a number of tanks and devastated shrines, noticed at village Ghunsaur, prove that there existed an early medieval township in this locality.

36. Excavation at Chichali, District Khargone

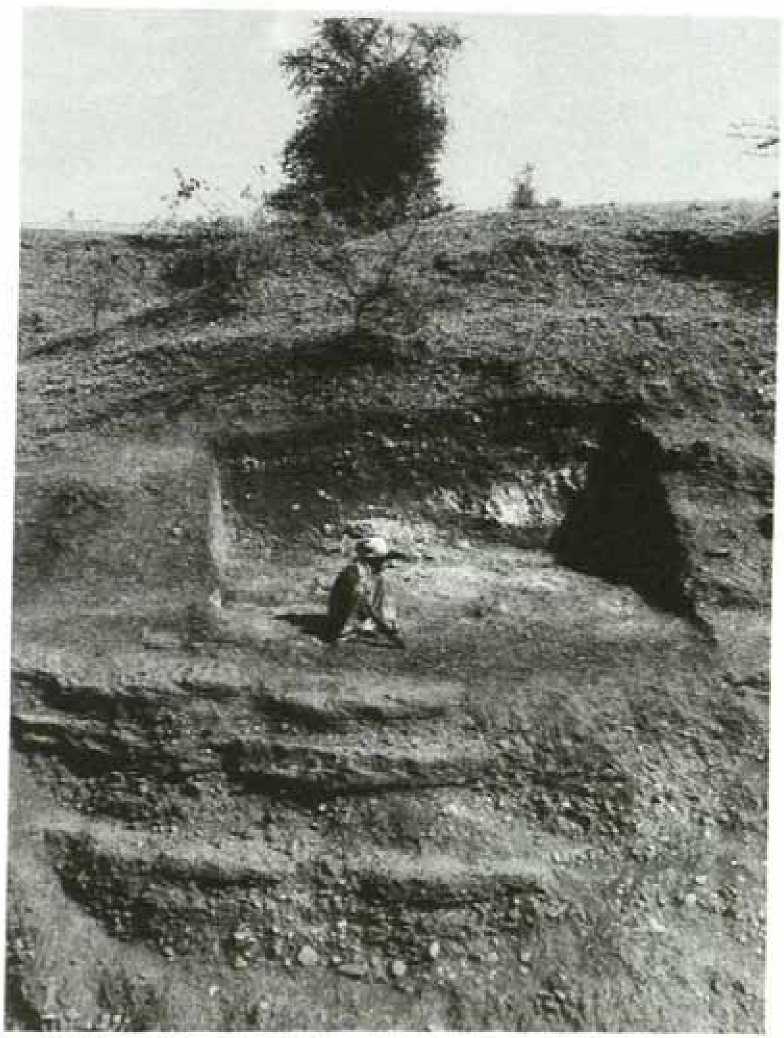
The Prehistory Branch, Nagpur, of the Survey, under the direction of S.K. Mittra, assisted by V. Shivananda, N.B. Sahu, Indira Tiwari, K.M. Girhe, R.K. Dwivedi, Pyara Singh, N.K. Nimje, Ghayasuddin, P.V. Janardhanan, PS. Pashine, P.C. Dogra, A.P. Gadekar and M.S. Kadhao, conducted excavation in village Chichali (22° 08' N; 75° 22'E). The exploration along the Sukli river, a palaeo-channel of Narmada yielded a conglomerated deposit and tools of the Lower Palaeolithic period (pl. 36)

The Lower Palaeolithic tools from the conglomerate deposit along with the exploratory finds, consist of handaxes, cleavers, chopper-chopping and marginally fashioned tools on small boulders (pl. 37). Materially the tools fashioned on chert and quartzite are predominant. Middle Palaeolithic tools comprised mini handaxes, discoids, mini chopper-choppings, different kinds of scrapers, points and flakes fashioned on different grades of chert, quartzite, quartz and occassionally chalcedony (pl. 38). While the Upper Palaeolithic tools comprise fluted cores, scrapers of different kinds, points, borers and flakes.

A significant achievement during the course of exploration was the discovery of a megalithic site in this part of the country for the first time, located approximately a kilometre east of the village at 1.60m contour level.

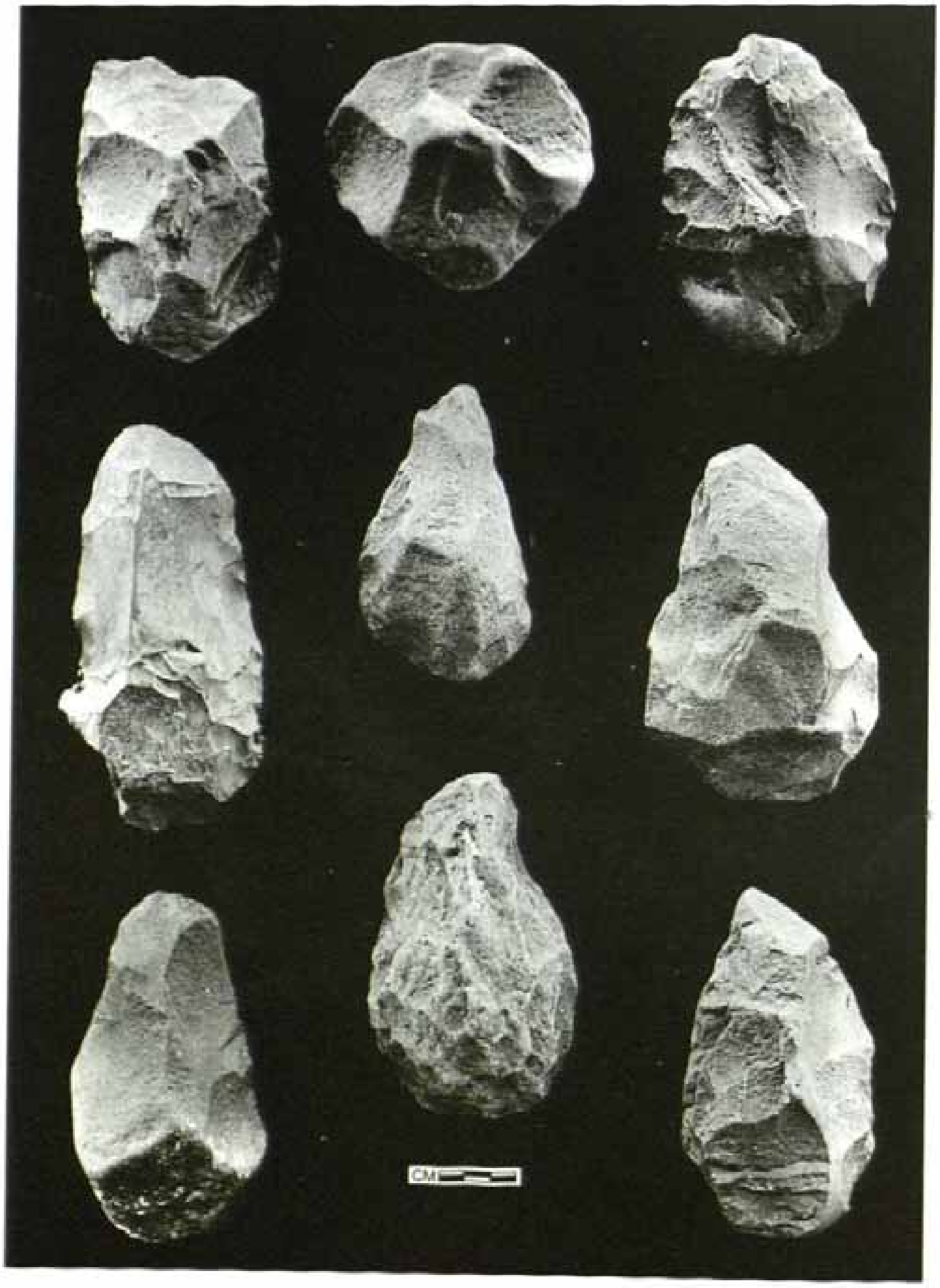
Approximately hundred megaliths were plotted, comprising two varieties. They are (a) Cairn circle and (b) Cairn heap circle. Out of these, two megaliths, nos. 9 and 33 were subjected to scientific excavation. It shows that the megaliths were constructed after depositing the funerary goods in the natural shallow depressions on the disintegrated bed-rock and covered with cairn heap and surrounded by big boulders (pl. 39). Sometimes a small cushion bed was provided with 5 to 10 cm

Plate 36



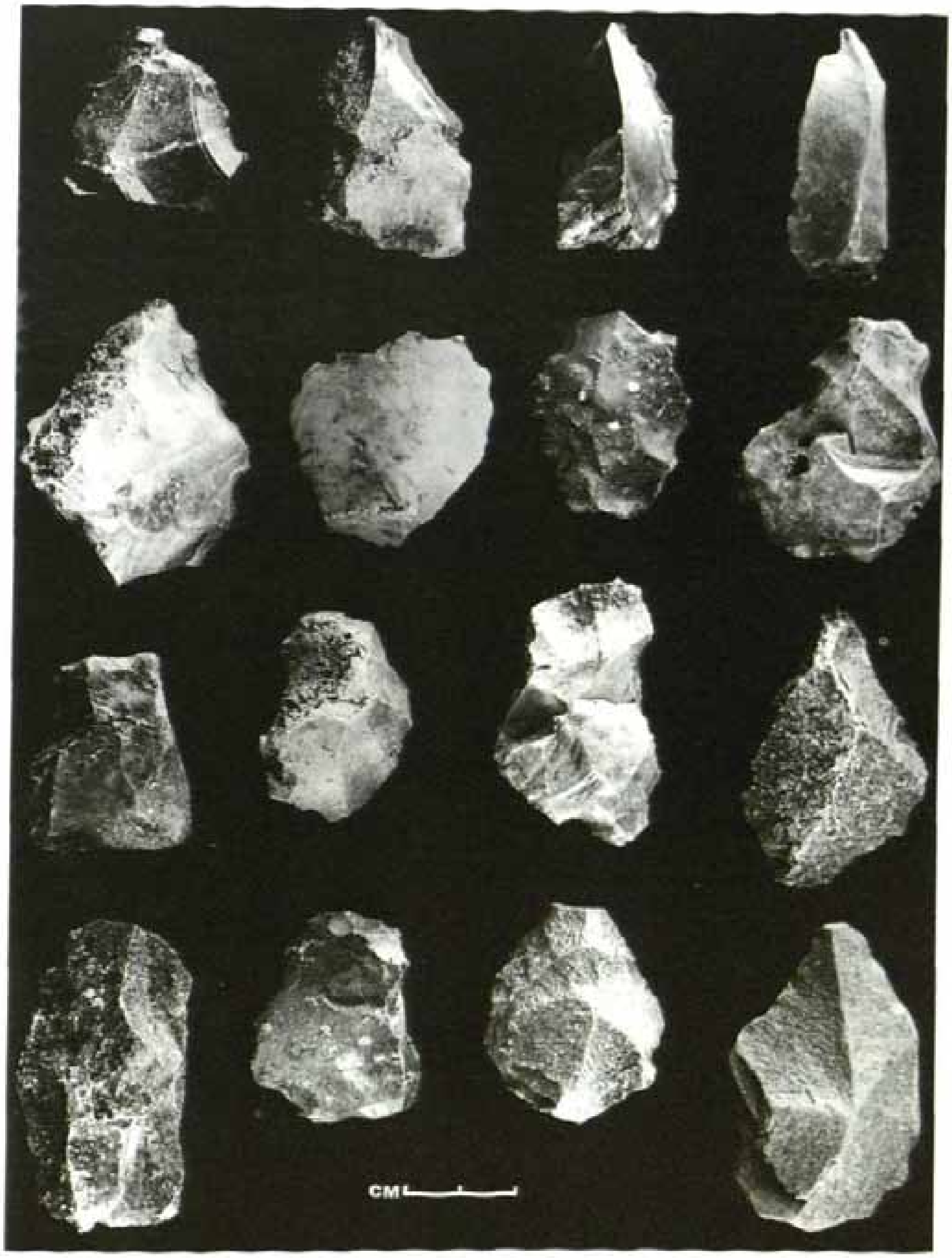
Chichali : section showing conglomerated deposit

Plate 37



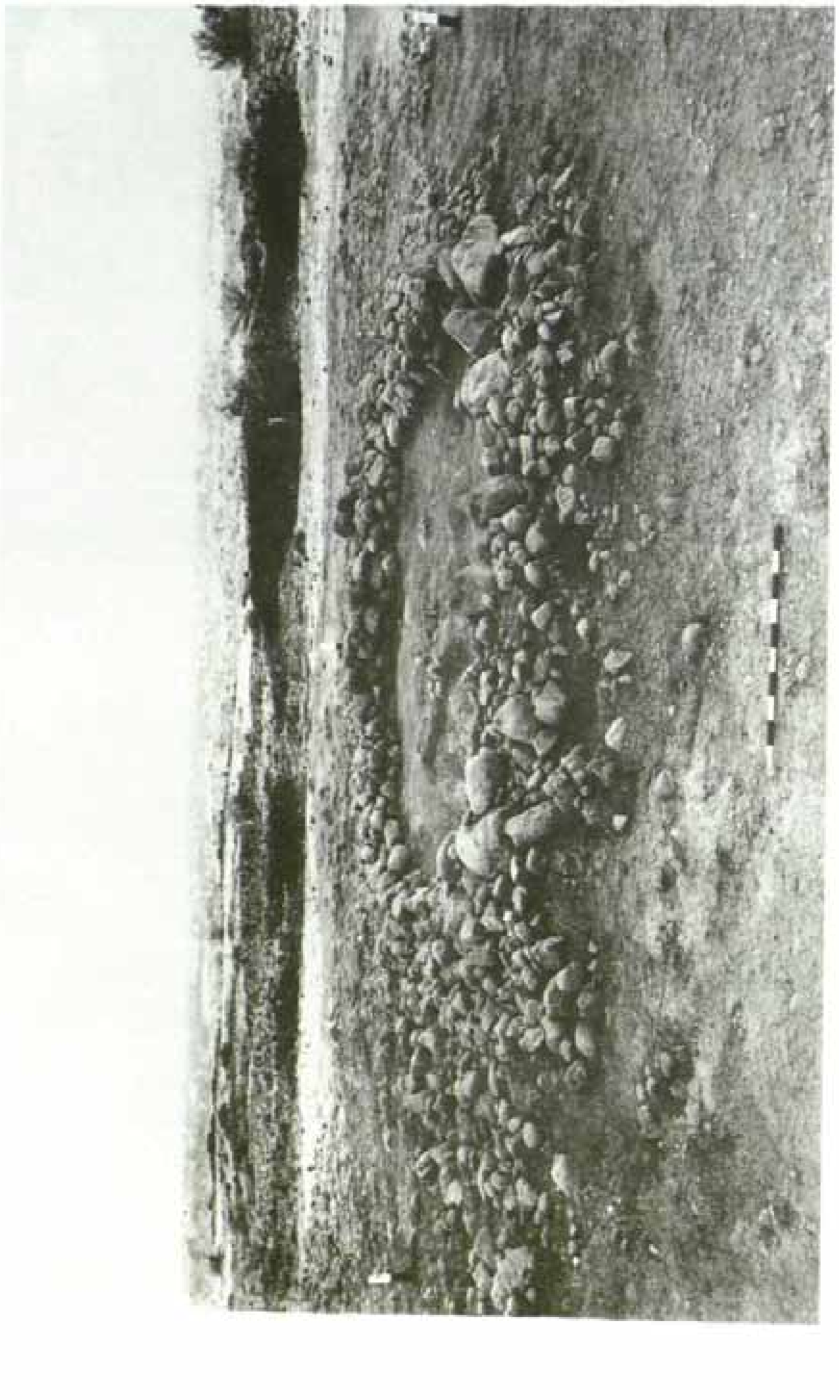
Chichali : Lower Palaeolithic handaxes, cleavers and chopper

Plate 38



Chichali : Middle Palaeolithic points, borer, scrapers and mini handaxe

Plate 39



Chichali : cairn heap circle

thickness over which the funerary goods were placed. Materially the excavation yielded fragments of post-cremated human bones (skull fragments, long bones, ribs,etc), red ware, dull red ware and black-and-red ware ceramics. A notable feature of these megaliths is the total absence of iron objects.

The Excavation Branch-I, Nagpur, of the Survey, under the direction of S.K. Mittra, assisted by V.Shivananda, N.C. Prakash, Ch. Babjirao, Prabash Sahu, N.K.S. Sharma, H.J. Barapatre, S.K. Gulrandhe, D.K. Kasbi, R.G. Nagulwar, A.E. Keshwar, S.M. Khairkar, R.K. Brahme, D.A. Kamble, S.A. Raut, M.R. Kambe and R.G. Patil also conducted a major horizontal excavation at Chichali (22° 08' N; 75° 22' E) in Kasravad taluk. The site is situated 5 km west of Nimrani on Indore-Bombay National Highway.

The ancient mound locally known as Gosai Tawda is located roughly a km east of the village Chichali and rises to a maximum height of 33 m from the water level on the left bank of the River Narmada. There are two mounds - one smaller and the other larger at Chichali. The former is located to the west of the later. The larger mound forms a horseshoe pattern on plan and the total area measures approximately 4000 sq m. Nearly half of the larger mound was subjected to scientific field investigation during the current year and the excavation revealed a deposit of nearly 4.5 m comprising tentatively four cultural periods:-

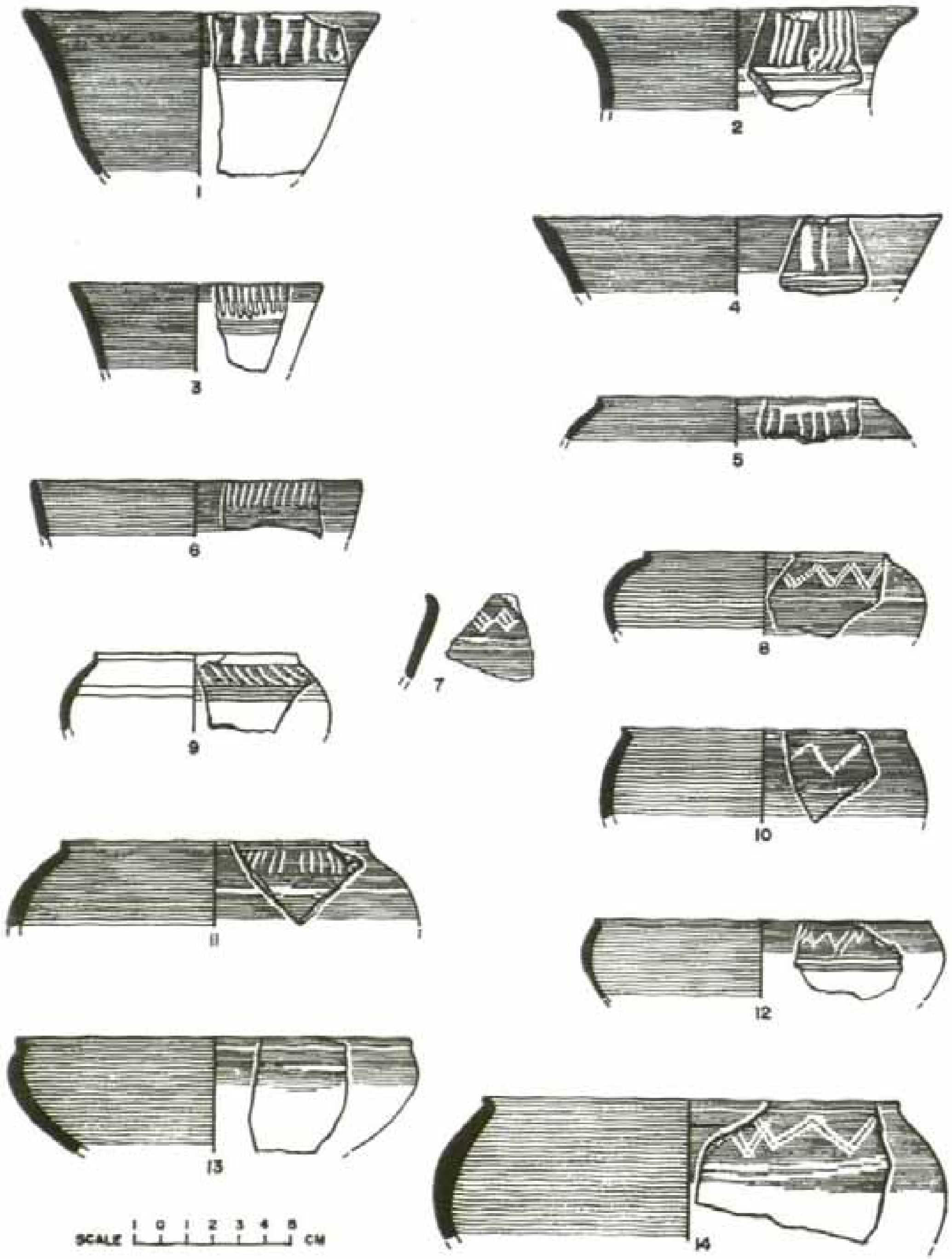
Period I	**Ahar**
Period II	**Malwa**
Period in	**Jorwe**
Period IV	**Early Historical**

On an average, Period I constitutes a cultural deposit of 25 to 35 cm. No complete house plan however, was unearthed. But the presence of a mud wall with centrally placed posts at regular intervals within the mud-wall and smaller post-holes along the edge of the mud wall excavated in a trench reveals that the Aharians built their houses with timber and mud with thatched bamboo screens on two sides of the wall for strengthening the same. Thus it is presumed that the Aharians were living in a semi-urban socio-economic conditions. The other antiquarian finds of this period consist of typical ceramics associated with Ahar culture in the form of white painted black-and-red ware (fig. 22), black on buff ware and incised red ware, microliths, terracotta figurines and steatite and semiprecious stone beads.

Period II which has approximately 1 m cultural deposit constitute the Malwa level. Structurally ovalish to circular house plans were excavated. The flooring was made with small river pebbles mixed with black cotton soil rammed by keeping the central portion little raised and mud-plastered. From a little distance, the side posts were erected and the thatched-roof was joined at the centre. The remnants of charred bamboo and reed, thatched-house were unearthed in plenty as a supportive evidence for the above.

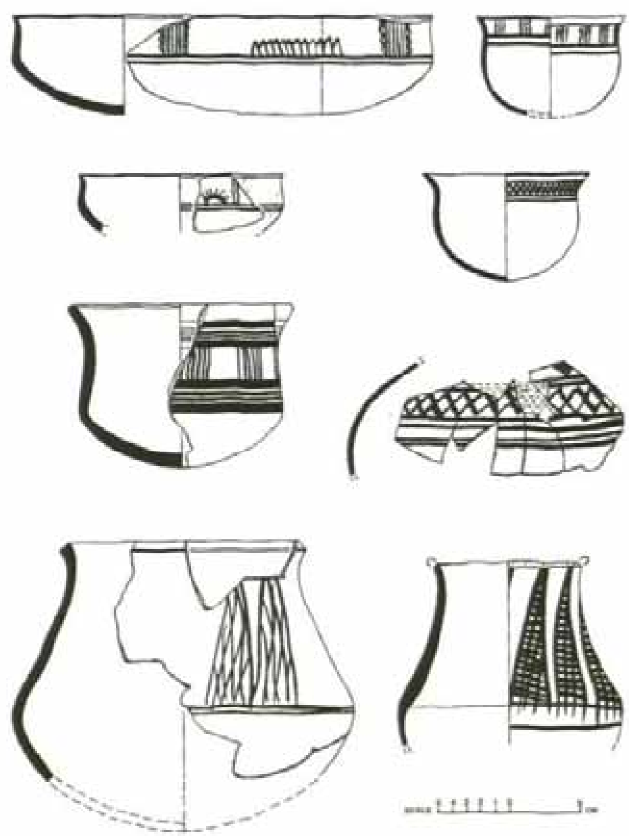
Antiquarian finds of this period consist of typical black on red ware (fig. 23), black on buff wash ware, red-slipped ware, red ware, dull red ware and a few black-burnished ware. The shapes include storage-jars, vases of various sizes, dish-on-stand, pottery stands (pl.40), basins and bowls. Significant among

Fig. 22



Chichali : white painted black-and-red ware

Fig. 23



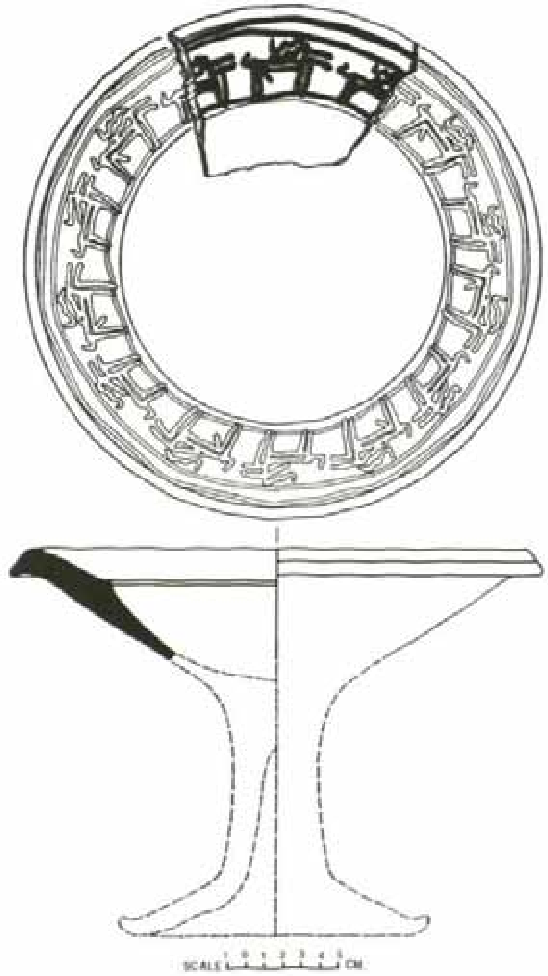
Chichali : Malwa black on red ware

Plate 40



Chichali : red-slipped ware pottery stand

Fig. 24



Chichali : reconstructed dish-on-stand

the ceramics are the representation of a two-horned painted animal (deer) on a fragment of a dish-on-stand (fig.24)' and woven gunny bag impression over red-slipped ware. The most distinguishing finds from this period are a broken vase of black on red ware richly decorated with an elongated neck and animal and a large storage-jar of red-slipped ware with a bevelled rim with high shoulder, bulbous body and saggar base decorated with two rows of encompassing circles executed with white mixed with brown colour. The other finds include copper fish-hooks, antimony rods, needle, microliths represented with parallel-sided blades, backed-blades, serrated-blades, points, lunates, trapezes, crested-ridged blades and flakes. Steatite beads, semiprecious stone beads of agate, chalcedony, chert, jasper, carnelian, shell and shell bangles constitute the other finds.

Like the previous period, Period HI also accounts for a thick deposit of approximately a metre. Structurally the Jorwe people continued to build their houses in the same fashion as that of their predecessors. Number of house plans excavated showed a sudden collapse of the structure and burning activity as attested to by the plenty of occurrence of thatched-houses, burnt pieces with bamboo and reed impressions.

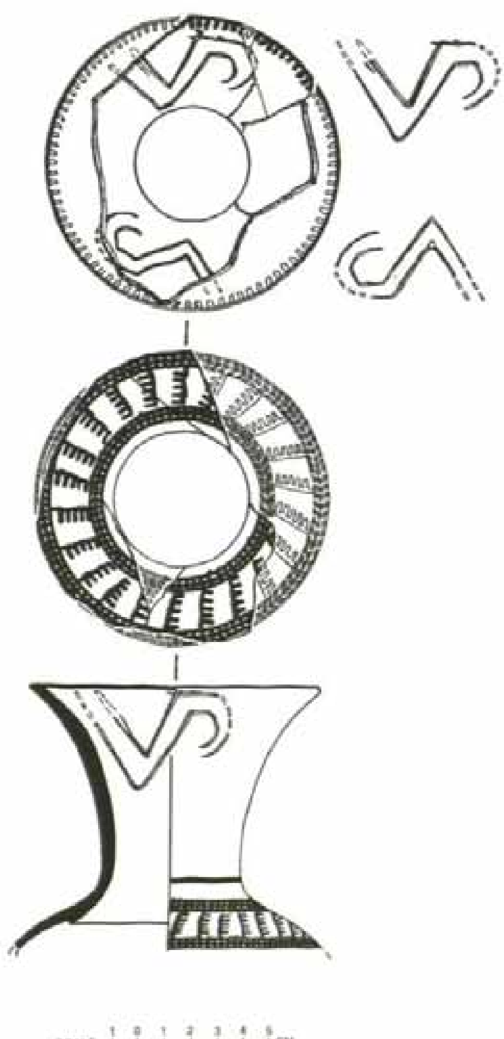
Typical of the Jorwe culture black on buff ware (fig. 25), black on red ware (fig.26), black on orange slipped ware constitute the major ceramics of this period, together with red ware, burnished black ware, red-slipped ware, dull grey and red ware. On a black on buff wash ware, the depiction of a row of stags is a significant find from this period. Typologically, all the ceramic types continue to occur from Period II. High-necked globular-bodied jars, painted, with or without graffiti marks appear for the first time.

Steatite beads and microliths (pl. 41) constitute the largest number amongst the antiquarian finds of Jorwe level along with beads of shell, semiprecious stones of carnelian, chert, agate and chalcedony, terracotta net sinkers and shell bangle fragments. Copper fish-hooks, needles, rings and antimony rods represent the metal objects of this period.

Period IV accounts for the maximum deposit at the site and chiefly represent the introduction of iron. Surprisingly, no brick structures have been encountered in this period. Circular house plans encountered in the excavation with their near affinity and continuity of the practice of hut building during this period without much change except for the fact that they have used lime extensively in each phase of repair of their houses : circular, squarish or rectangular on plan.

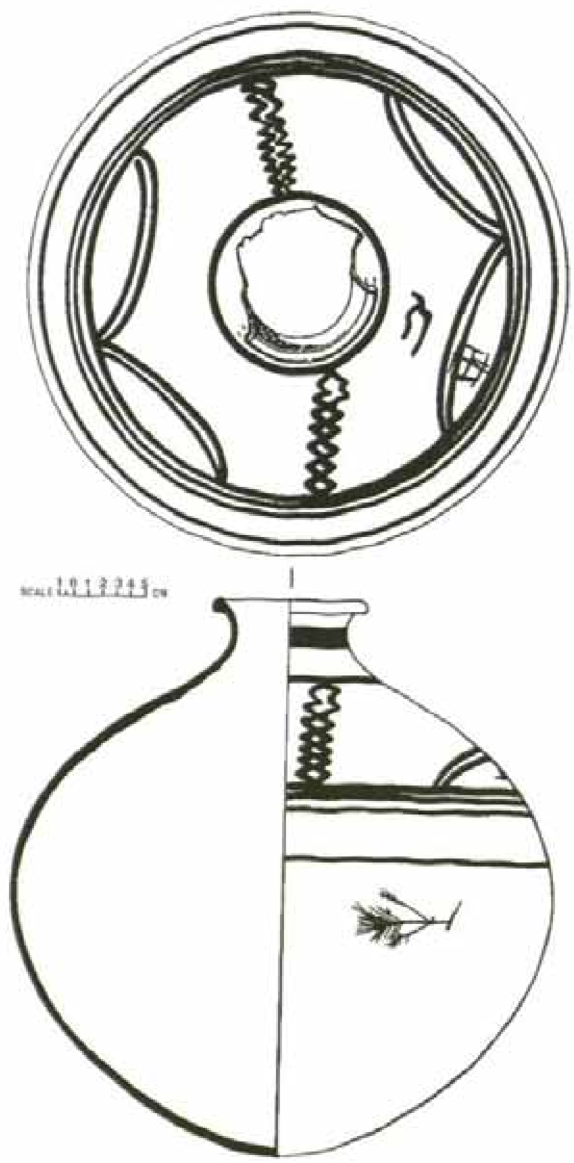
Major ceramic types represented in this period were red ware, red-slipped ware, black burnished ware, black-and-red ware, tan ware, black-slipped ware and dull red ware. A couple of NBPW and PGW sherds were recovered from the surface of the mound. Storage-jars, basins, vases of different shapes and sizes, carinated *handis,* bowls and miniature pots constitute the pottery types of this period, along with stamped and applique decorated sherds. A special mention may be made here of a find of three-handled, wide-mouthed, globular-bodied, large storage-jar of red ware fitted with an elephant head *(gajamukha)* at the shoulder (pl.42). The *gajamukha* was luted to the body perhaps to function as a spout but the main body of the pot

Fig. 25



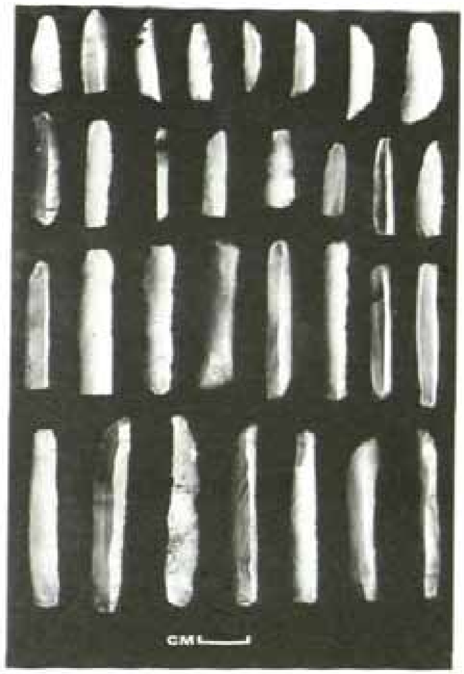
Chichali : Jorwe black on buff ware with graffiti

Fig. 26



Chichali : Jorwe black on red ware

Plates 41-42



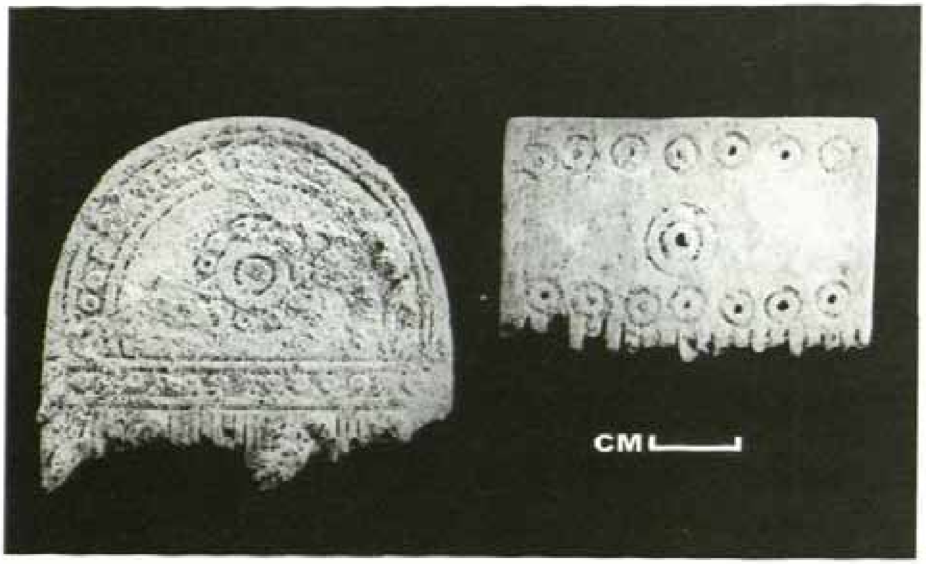
41



42

Chichali : 41, microliths from Period III and 42, elephant-headed red ware pot from Period IV

Plates 43-44



43



44

Chichali : 43, *decorated ivory combs and* 44, *iron objects*

does not have any opening and hence non-functional. The bulk of antiquarian finds of this period account for beads of plain and etched carnelian, agate, chalcedony, crystal, jasper, chert, lapis lazuli, amethyst, opal, quartz, faience, terracotta and shell bangles. Decorated ivory combs of rectangular and crescentic shape (pl.43), decorated ivory kohl sticks, bone points and ear studs of different shapes in chert, jasper, agate, shell, bone and terracotta have been found. The other terracotta finds include gamesman and birds, net-sinkers, spindle-whorls, hopscotches, wheel and animal figurine.

Few antiquities of copper have been found with indeterminate shape. Apart from these, a good number of iron objects such as arrow-heads, pick, points, fish-hooks, finger rings, bangles, spoon and hoe (pl.44) were also found.

Animal bone fragments encountered in all the periods in large quantities suggest a uniform food habit which persisted at Chichali for more than thousand years. These include bones of bull, sheep/ goat, *sambhar,* deer and so on. Besides wheat was produced during Ahar, Malwa and Early Jorwe periods as attested to by the charred grains encountered in the excavation. The other charred grains from late Malwa-early Jorwe periods include rice, lintel, green gram, *masur* and *Indian jujube.*

A very significant stratigraphical observation made in a trench on the central southwestern segment of the mound reveals faulting of strata. Perhaps caused due to an earth quake of mild intensity that Chichali faced in ancient times. The faulting of strata must have occurred at the end of Jorwe period as could be noticed from the stratigraphical evidences and further corroborated by the nature of uniform destruction of Jorwe houses due to collapse and fire, unearthed at the same level and time at the site. However, for proper understanding of this problem with more conformity, further probing is required.

MAHARASHTRA

37. Excavation at Paithan, District Aurangabad

In continuation of the last year's work *(1997-98,* pp. 125-129), excavation was resumed under J.V.P Rao of the Mini Circle, Goa, of the Survey, in collaboration with Derek Kennet of the Society for South Asian Studies, U.K., and assisted by Manoj Saxena, Goutam Haldar, M. Kasturi Bai, Giridhari Gaikwad, Sirdeshpande, Lindsay Lloyad Smith, Edward Eastaugh, Nick Wells and John Martin. During this season the excavation was taken up in Trench A, and D1, D2, E besides continuing in Trench B, on the protected site and Trench F on the central town mound, in order to know the nature and extent of different occupations within Paithan through the ages and the urban activity during the early historic times, since the site was known as a capital and a trade centre for the early Satavahanas during the first century BC.

The phases established in 1998, and reported in the previous report, has largely stood up to more detailed and careful scrutiny. However, some relatively minor changes have been made. These are partly due to the discovery, in the South Building, of an early phase that was completely concealed by later construction (now phase I). The phase of the North Building has remained unchanged except for the fact that the internal *antarala* structure once thought to be the phase IV is now understood to be later than the inner *mandapa* wall. The *antarala* structure has now been labelled as,

phase V and inner *mandapa* wall as phase IV. The later phases of both the buildings present difficulties because much of the evidence was removed by Yusuf in 1937, apparently unrecorded.

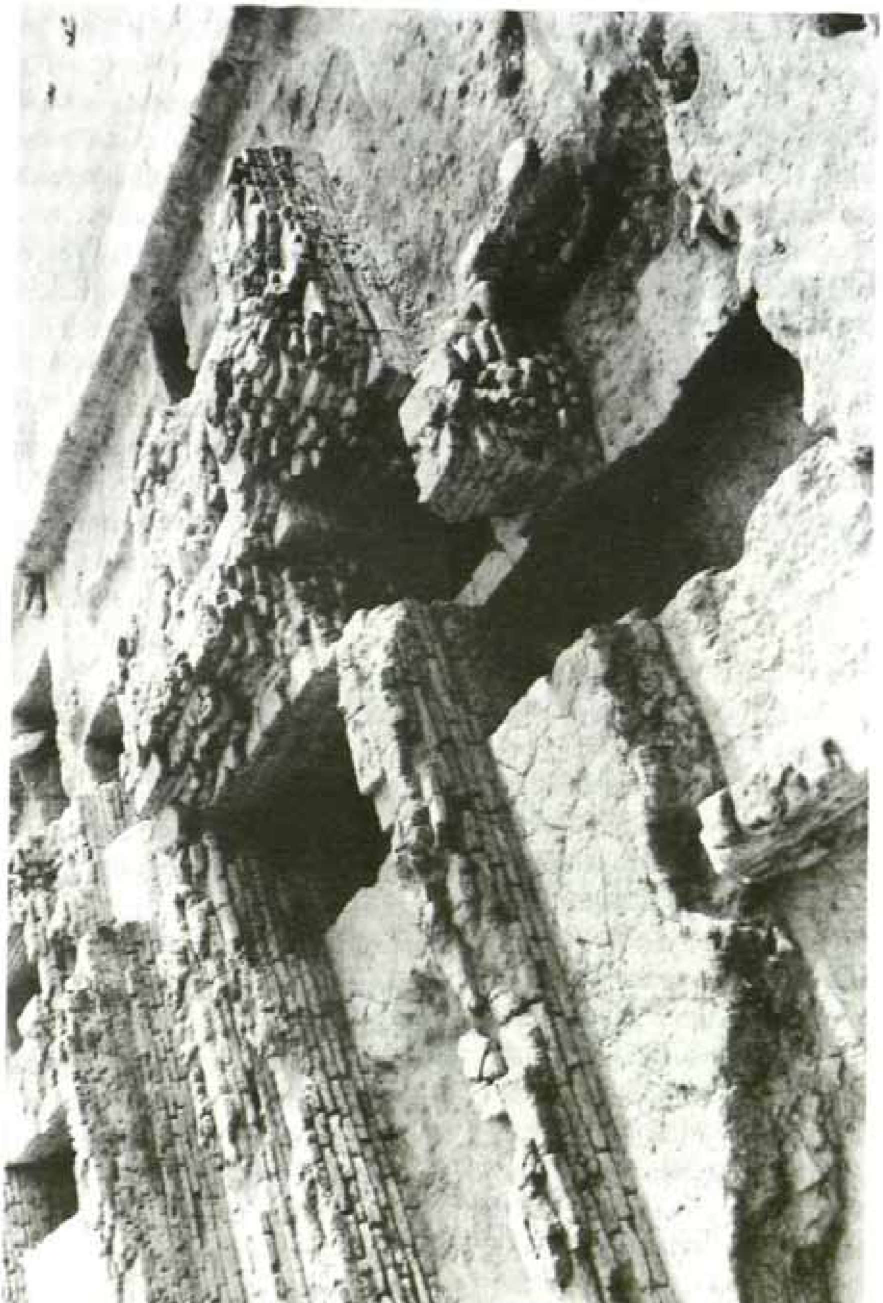
Further information on phase I structure of North Building (pl. 45) has been uncovered. It has now been possible to propose a tentative isometric reconstruction of the lower courses of the North Building during the first three phases. The nature of the outer wall of phase I shrine has been clarified down to its lowest courses. The simple two brick inset mouldings seem to be most closely paralleled at Ramtek, where on the Kevala-Narasimha Temple at least, it seems to be datable to the fifth century. The inset in the lowest two courses appears to be structural rather than decorative. This moulding, if it can be called such, would suggest the date of the earliest temple construction. Phase I of the North Building is without doubt the earliest construction within Trench A.

The phase II structure has been further uncovered in Test Pit 9. The east wall has now been completely uncovered and stands to a height of over 1 m. There is absolutely no sign within the fine brickwork that there could once have been an entrance in that wall. It must therefore be assumed that the entrance to the phase II shrine was from the riverside (i.e., the west). There is no problem with this and there are numerous other temples and shrines which have access from this direction. The difficulty is to explain why the *mandapa,* when it was added in the third phase, was added to the east. The most convincing suggestion, offered by M. Willis of the British museum, is that there may well have been a subsidiary deity in a niche higher up in the eastern wall of the phase II shrine. It may be that the cult of this particular deity grew in importance until it actually superseded that of the main deity within the *garbhagriha.* Such instances are known from elsewhere. The suggestion would therefore be that the *mandapa,* when it was finally constructed in phase III, was intended to cover a makeshift outdoor shrine against the east wall. Excavation in Test Pit 9 (below) has uncovered evidence for three phases of use as a shrine within the *mandapa* before the temple went out of use.

Due to the fact that the walls of the North Building are only preserved to a height of about 1 m, there are still some problems with the *adhishthana* mouldings of phase II *mandapa* and also with the way in which the phase II shrine shows the joint between the brickwork of the two structures. The lower courses of the *mandapa* clearly abut and overly the phase II wall and platform also shows evidence for a later addition to the upper parts of the *mandapa* wall about which there is very little to say. Above this, two walls have been carefully interbonded, a fact which suggests that phase II structure was also rebuilt at a later date. A slight decline in the quality of joints in phase II brickwork above the ninth course is evident.

The reason for allocating the black-cotton soil shrine in the interior of the temple to phase V needs some explanation. After the 1998 season it seemed clear enough that the internal wall (558) must have been cut through the black-cotton soil. However, upon excavation in the 1999 season it proved to be impossible to find a cut of any sort. In fact, it was often quite obvious that the black-cotton soil abutted the internal wall. It seems, therefore, the most likely explanation is that the black-cotton soil should be interpreted as part of a feature postdating the internal wall. In support of this interpretation is the fact that the two most westerly bricks of the lower courses of internal wall have been omitted in order to avoid disturbing the silt deposits associated with the crude shrine identified inside the *mandapa.* If the foundations

Plate 45



Paithan : different structural phases of northern building

of internal wall had been excavated through half a meter of black-cotton soil, it is almost impossible to imagine that the builders could have been aware of the shrine that had long since gone out of use. Thus, the black-cotton soil must be later than the internal wall.

Investigation of the South Building involved the excavation of Test Pits 1, 3 and 5. Test Pit 5 was located inside the *mandapa* of the building. By cutting below the base of the walls it was possible to establish the presence of an early phase of use that had not been noted in the 1998 season. The type of brick masonry of the early wall (1224) is similar to that of the later walls and for the most part, the wall thickness is identical. However, in the area around the *garbhagriha,* the phase I walls were as much a 35 cm thinner meaning that the *garbhagriha* would have been upto 70 cm wider in phase I. It seems that during phase I, there was a wide doorway between the *garbhagriha* and the *mandapa*. Phase I is represented only by the foundation course of the wall. It seems that the temple must have been extensively rebuilt at the end of phase I. It has also become clear that the *adhishthana* mouldings on the western and southern walls of the temple are most likely to be datable to the time of the phase IV extension of the building. This is suggested by the fact that the character of the brick masonry changes notably above the first inner-bonded course between the main buildings and the southern extension. It would, therefore, seem that at the time of the southern extension most of the southern and western walls were rebuilt including the *adhishthana* moulding (possibly also the northern wall but this was later destroyed). This is not to say that the phases I-III buildings did not have *adhishthana* mouldings, just that nothing is left of them.

Probably the most important and interesting information which came to light in the 1999 season is that related to the foundation cuts and deposits for the temples. The details of Test Pits 1,3,5 and 9 in which this information was revealed, are described below. To summarize, the first phase of each building appears to have been founded in a very similar way. In both the cases, foundation consists of an almost vertical, 2 m deep, rectangular cut, the size and shape of the building. Both cut through all the archaeological deposits to reach the very distinctive, natural, black-cotton soil which contains no (or very little) anthropogenic material. It is quite possible that there is some significance in this fact. The large rectangular holes were then carefully back-filled with successive layers of boulders of Deccan trap in a pure silt matrix alternating with layers of pure but compact silt. As many as five sequences of this type were used to fill the foundations. Careful examination will reveal the numerous tip-lines of silt in-between the stones in the fill under the South Building. It is possible to distinguish individual gamella loads of earth which have been tipped in a very orderly fashion. So far, no other examples of this type of foundation from brick temples are known. Of course it is possible that other temples may not have been examined in sufficient detail, making it impossible to decide whether the foundations of the Paithan examples are unique. It seems quite clear that the rationale behind these very substantial foundations is ritual rather than practical or structural. There may be some significance in the fact that the foundation cut down to natural soil, thereby reaching pure earth. The nature of the fill may also have some religious significance. Apart from the geometric markings discovered in the *garbhagriha* of the North Building, there is no evidence of any ritual offering or practice underneath the *garbhagriha* of either building, despite the fact that they were both excavated below the bottom of the cuts.

It is important to note that there are some slight

variations between the nature of the foundation of the North and the South Buildings. The stones used in the North Building are smaller and more angular. The silt surrounding them seems to be less compact and less pure than that used in the South Building. Lloyd-Smith, excavator of Test Pit 5 has also noted some variation within the fill under the South Building.

It will be clear from an examination of the section from Test Pit 3 that the top of the foundation cuts appear to have been recut at a later date. Normally there would be no problem with this, although it does make it very difficult to establish from which level the original cuts were made. However, it has been observed that such recuts are a standard and uniform feature of the foundation cuts on all sides of both the buildings. All of the recuts are to the same depth, namely the top of the foundation fill. Such regularity makes an interpretation as arbitrary recuts unconvincing. It seems more likely that the fills are simply a part of the foundation process; the foundation cut being filled below ground level as described above, the space between the base of the walls and the ground being back-filled with a different type of material.

Test Pits 1 and 3 both revealed sections through the pre-temple deposits in the area of Trench A. These deposits were about 1.5 m deep and can be sub-divided into broad phases; the first deposits tend to be rich in brick rubble and the other debris from construction or demolition activity. Above this the deposits become silty and contain pottery and bone but little building material. Above these deposits the temples were built. This evidence suggests that, although there was other building activity going on not far away, the temples are the earliest construction at this location. The silty deposits suggest a period of time when the area was a weed-covered dump close to a larger settlement.

Despite two attempts (Test Pits 3 and 4), it was not possible to establish a stratigraphic relationship between the foundation cuts of the two buildings. It is possible that this information was removed by Yusuf in 1937. In summary the brick sizes used in the first three phases of the North Building are smaller than those used in phase IV of the North Building and all phases of the South Building (the earlier measure 40 cm in length, the latter 43 cm). The newly-discovered phase I wall of the South Building confirms to this pattern. This suggests very strongly that the South Building was built after the construction of phase III of the North Building.

Very little remains of the post-temple deposits in the trench exist, most having been removed by Yusuf. An attempt was made to investigate this problem by opening up the area of the south of the two buildings. This work revealed the presence of a rough stone wall consisting of very large boulders of Deccan trap running from the western end of the South Building towards the south. It appears that this same wall was rebuilt a number of times as the foundation fill of another phase was also exposed. Various pit fills and deposits were excavated which, once studied, will give some information on the date of abandonment of these buildings.

During the first four seasons of Paithan excavations, work has been based almost entirely in the protected area of the Survey which is located south of the present town of Paithan (Trenches A,B,C,D1,D2, and E). An important part of the research objectives of the project is an elucidation of nature, size, dating and development of the important early historic town. Clearly, therefore, it is important to have an understanding of more than this one area of the town.

An examination of the contour map of Paithan reveals that the heart of the archaeological site is massive, 1 km long mound running along the north bank of the Godavari. A study of the geomorphology of the surrounding district makes it quite clear that this mound is made up of archaeological deposits situated upon an irregular and slightly mounded river terrace.

It is quite possible that the early-historic settlement covered all or only a part of this very large mound. It could be that the main focus of settlement stayed in the same location throughout Paithan's history. It is also possible that the main focus of settlement moved from one location to another on the mound.

In order to have some idea of the date and nature of the site and its size, it is clearly fundamental that soundings be taken across the mound to establish the depth, date and nature of the archaeological deposits in different places. It was therefore decided, early on in the project, that a number of test pits should be excavated. Of course this presents no problem within the protected area of the Survey which is unoccupied. It presents much more of a problem over the rest of the mound (the vast majority of the actual site). This is because modem Paithan is a very healthy and vibrant town with a very densely-packed urban structure. It is difficult, within town, to find an area larger than 5 sq m which is free and suitable for excavation. Added to this is the fact that the whole land within the town is privately owned by numerous freeholders. Despite our best, and not inconsiderable efforts, is proved to be impossible to gain permission to dig more than one soundings-Trench F. Trench F is situated at the northern tip of the mound.

Trench F did not yield results that were very encouraging. The section demonstrates considerable period of time during which there appears to have been little activity in that particular area. Trench F is the only trench in which evidence for occupation of the first-second century AD has been discovered, but this is not very substantial.

An outline of the results of excavation of Trench C points to a consistency with those from Trenches D1 & 2, E and the pre-temple deposits excavated in Test-Pit 1, Trench A. All these trenches suggest that the area under the Survey's protection was, for most of its history, only sporadically occupied. At times the area appears to have been completely uninhabited and was used as a peripheral dumping area outside the central part of the site which must have been located elsewhere on the mound. There is some evidence of minor industrial activity in Trench B as well as evidence of second century BC occupation in Trench Dl and occupation of the early historic period.

Extensive examination of sections, non-archaeological excavations, surface scatters and standing buildings was carried out in an attempt to gain an insight into the archaeological deposits on the main mound. In the course of these, a number of areas with limited evidence of early historic pottery were located. On the whole, the evidence suggests a fairly shallow stratigraphy which has been heavily disturbed by later, especially post-medieval occupation.

To summarize the preliminary conclusions it would be correct to say that the main centre of occupation at early historic Paithan seems not to have been very substantial. It apears to have moved from place-to-place (hence the different sequence from each trenches) which seems to be very badly preserved due to later building activity.

38. Excavation at Shakshal Pimpri, District Bid

The site of Shakshal Pimpri is on the left bank of River Sindhphana opposite the village of the same name. This site was discovered in December 1995, during the study of the Pleistocene climatic changes in River Godavari. The site consists of a scatter of microliths, bones and shells found in the margin of a field. A few potsherds were also found on the surface. The shells were subsequently dated to 7,800 years by the Birbal Sahni Institute of Palaeobotany, Lucknow. The bones from the site gave a Flourine Phosphate ratio of 4 which is also indicative of a pre-chalcolithic age. Therefore, the study of the associated pottery and the other cultural material was taken up. A second visit to the site in 1997 showed that the pottery was much more abundant than initially noticed. Therefore, it was taken up for a small-scale excavation to determine the relationship of pottery with the bones, shells and microliths.

Sheila Mishra, Shushama Deo, P.P. Joglekar, Sonali Naik and Aarti Deshpande-Muhkerjee of the Department of Archaeology, Deccan College Post-graduate and Research Institute, Pune, carried out excavation at the site and four 2 m x 2 m trenches were laid out. The Trench one and two were taken about 50 m from the field margin close to the pottery scatter identified in 1998. In these trenches small abraded potsherds, bones, microliths and burnt-mud were found to a depth of 25 cm, within the ploughzone. There was no deposit covering the cultural material and after 25 cm the cultural material became rare. This material therefore, seems to be on the surface. No shell objects were found in these trenches. A third trench was taken in the area of greatest concentration of shells, which is close to the edge of the field bordering the river, and more to the east of TP1/2. In this trench the upper ploughzone has abundant shells, some microliths, a few bones and some pottery. The shell layer is *in situ* at about 20 cm depth. Just below the shell bed there is yellowish sandy silt impregnated with calcrete which continues below. Some microliths and burnt-mud continue below the shell bed and are also associated with it.

A fourth trench was taken further into the field i.e., N of Trench 3 which yielded pottery, bones, microliths and some shells in a 25 cm ploughzone above the calcrete layer seen in TP 3.

Finally a surface collection was made in strips of 5 m paralleling the river. This showed that shells occur in the SE corner of the field with bones and pottery occuring further away from the river. The context of the material is the same, i.e., with the ploughzone and above a distinct calcrete layer. The shells are just at the level to escape the plough and are intact and appear to be cultural debris. That is discarded by the people after utilization for food and bones have a slightly different distribution form the shells. Microliths are found throughout.

The problem of associating the pottery with the shells therefore, remains. The different distribution could be due to different periods of human activities or different activity areas during the same time. It is neither acceptable nor rejected that the pottery and shells are associated.

The excavation revealed a systematic sample of the cultural material. The pottery is crude, hand-made mainly representing basin with a few incised decorations. Some specimens have traces of a burnished slip. The bones are under study by PP Joglekar and shells by Aarti Deshpande Mukherjee. A complete report of the site along with the late Quaternary sequence at the site is under preparation.

39. EXCAVATION AT MANSAR, DISTRICT NAGPUR

In continuation of the last year's {*1997-98,* pp. 123-133) excavation, the Bodhisattva Nagarjun Smarak Sanstha Va Anusandhan Kendra, Nagpur, under the direction of Jagat Pati Joshi and A.K. Sharma, assisted by P.M. Khobragade, Julfequar Ali, Dhriendra Sharma and J.S. Dubey extended the dig to the northwestern, southwestern and western slopes of the site MNS-3. By the close of the season's work a sizable temple-complex belonging to Eastern Vakatakas has been exposed. It is quite evident that the Siva shrines exposed so far, belong to two phases. Taking advantage of the massive retaining walls built of dressed and undressed stone blocks and bricks measuring 46 X 27 X 7 cm were apparently raised to make a flat platform on the top of the hill for the construction of a temple and later a stupa. Around the temple in the first phase, the shrines were mostly constructed on the northern side where two natural caves exist. One of the caves was also converted into a shrine by laying bricks on the floor and plastering it with lime-plaster and then applying over it red-ochre paint, while the other cave was used as a meditating chamber by constructing concave brick walled approach, the wall ultimately closing on the top. The shrines were built over fluted base with sharp angles making octagons. Over these octagons, simple rectangular shrines were raised, each having a niche facing north for the deity and having an approach from either the east or the west. Right from the bottom of the octagonal base, a straight staircase led upto the outerside of the shrines and later on to the cave shrine. The foot of this staircase had a brick-built semicircular *Chandrasila,* whereas two narrow staircases lead to the cave shrine apparently to maintain one way flow of devotees. In order to close the roof of these staircases, triangles and inverted triangles have been used in the construction. The walls and the steps were well plastered with lime-plaster, also using lime-concrete for strengthening the surface of the steps. Red sandstone sculptured pieces mostly belonging to Saiva cult have been recovered from these shrines.

On the western and southern sides a row of Siva shrines built of bricks were exposed. These shrines built in three terraces are approached by flight of steps. So far three rows of flight of steps have been exposed. Out of total sixteen shrines exposed, six have *Siva-lingas,* one each resting over a square brick pedestal having a *pranala* on the northern side whereas in some cases only pedestals are present. The pedestals have been made out of chiselled-bricks. None of the *Siva-linga* is associated with any stone circular *yoni pitha.* However, most interestingly, one of the shrines was built in the form of a *yoni pitha* itself with the *linga* in the centre of the shrine over a brick pedestal (pl. 46).

Vertically all the shrines were built in the form of lotus buds by adopting the triangles and inverted triangles (equilateral). Method for raising petals that ultimately close into a pointed end making the closed roof of the *sikhara* was adopted. The evidence clearly show that the whole complex was plastered with lime-mortar. At the base of these shrines, on the southern corner of one of the steps, a burnt wooden *yupa* was found, apparently for offering sacrifices to the deities. The triangles, particularly on the outerside *of the jangha* portions of the row of shrines, make a human face. Almost each shrine has an approach either from the east or the west, with some having a small *mandapa* and small semicircular or triangular *kunda* for water-storage

Plate 46



Mansar : Siva shrine

near the steps. In one of the shrines, the *linga* has been kept over a square brick pedestal just below the natural rock inclined.

On the southeastern corner at the base of the steps, two square *hawan kundas* were exposed. A large number of fragmentary sculptures and architectural members of temples mostly of red sand stone have been recovered from the debris sealing these shrines. The sculptures display superb craftsmanship in delineation of facial and physical features as well as the decorations. Apart from these, sprinklers and ajar having eleven holes at the base, mostly of fine red-slipped ware; copper and iron objects (nails, dowels and chisels), earthen lamps, etc., were recovered.

The most noteworthy find is the factory site of clay sealings on the northeastern corner, just at the base of the northern row of shrines. The baked clay sealings (pl. 47) bear the legend in box-headed Brahmi character, reading *pravaresvarasya* referring obviously to *pravaresvare deva kulasthanat* referred to in the well known copper plate inscription from Pandhurna. The main shrine was obviously the *devakula* temple, the dynastic temple of the Vakatakats made by Pravaresena II (AD 420-450) in memory of his great grandfather Pravaresvara I. Incidentally, the Pandhurna Copper Plate mentions its issuance from Pravaresvara Devakulsthanat or Pravaresvara Temple which has now been unearthed at Mansar (ancient Pravarapura). The additions in second phase were carried out probably by Prithvisena II, who was a known devout Saivite.

Apart from a number of sealings that bear the legend *pravaresvarasya* and *shri Jaivirdhi,* some sealings depict elephant, the animal that appears to have of great importance to the Eastern Vakatakas.

The lotus bud pattern of shrines discovered at Mansar display superb example of *vastukala* and construction of shrines without any regular, flat or domical roof as the ends of top petals joined and made the *sikharas* of the shrines.

40. EXPLORATION IN DISTRICT NAGPUR

The Department of Ancient Indian History, Culture and Archaeology, Nagpur University, Nagpur, undertook an archaeological exploration programme with a view to locating and documenting the new and known archaeological sites.

The District Nagpur is found to have been largely occupied by the Middle Palaeolithic people whose cultural remains in the form of thousands of finished and unfinished stone flake tools are encountered at many places not only in and around Nagpur city but also in many other parts of the district. The discovery of a fossilized molar of an elephant on the banks of the Nagnadi in Nagpur city is noteworthy.

Further, twenty-eight megalithic stone circles were also traced by the Department on the southern slope of the Vena reservoir situated at a distance of 29 km from Nagpur on the Nagpur - Amravati (NH-6) Road. Some of the circles have already been submerged under the water while the remaining are being threatened with submergence and indiscriminate quarrying. Therefore, the extant circles have been documented and six circles were proposed to be taken up for excavation during the next season.

In the course of the present exploration, the Department further discovered a group of three rock-

Plate 47



Mansar : baked clay sealings

cut caves in a small north-east south-west oriented hill range (78° 36' *E: 21°5'* 30"; N), locally known as Ramgarh hills rising about 1800 ft above the MSL almost 12 km south-west of the village Kondhali which is 45 km west of Nagpur city on the Nagpur-Amravati Road (NH-6). The caves are of different dimensions and without any decoration excepting the prominent chisel marks. All the three caves have horseshoe-shaped opening and a vaulted ceiling.

Cave 1 is the smallest of the three, having a depth of 2.3 m, width of 2.15 m and a height of 1.2 m. It is situated at a height of 37.5 m on the western side of the hill. 10 cm X 10 cm and 15 to 17 cm deep holes on either side of the mouth of the cave and small groove on the upper edge of the cave are worth mentioning.

Cave 2 is located at a height of 34.2 m on the northern slope of the hill. It is 5.2 m wide and 8.5 m deep with the inside height varying between 1.4 m and 1.45 m.

Cave 3 is situated on the same slope as Cave 2 at a height of 14.8 m from the ground level. It is the biggest *of* the three, measuring 3 m wide at the entrance but 4.3 m at the back with its height varying between 1.9 m near the entrance and 3.6 m at the back. A shallow niche (lm X lm) dug out in the left side-wall of the cave was found empty. Another narrow and very deep tunnel has been noticed on the right side at the back of the cave at the floor level. Excepting at one or two places, there seems to have been an attempt at smoothening the walls or back of the cave. The cave has been converted into a temple of Siva by the local people and hold celebrations during Sivaratri.

In the absence of any datable antiquity nothing conclusive could be ascertained, with regard to the antiquity of the site.

MANIPUR

41. EXPLORATION IN DISTRICT SENAPATI

The Saranamei village is located 2 km away from Paomata Centre, on the top of the Simi Deichei range at a distance of about 128 km from Imphal. The site is bounded on the east by Phuba village, on the west by the Tungam, on the north by Liyai Khunou and Khullen villages, on the south by the Barak river and on the further south by the Maram villages. The survey of megalithic monuments was conducted by P. Binodini Devi of Manipur University under the direction of T.C. Sharma.

The village area of Saranamei abounds in megalithic monuments. Almost all the megalithic remains in the area are dominated by menhirs. Other constituent types that occur along with such structures, are dolmens, flat stone seats, stone circles, cairns and monoliths (in the form of grave stone or religious stones). The megaliths found in this area are classified on the basis of their functions into six types. They are listed with their local names, classified types and functional type as under:

	Sub-type	*Paomei*	*Donmai*			
Menhir (Zaosochu)		**72**	84	46	63	265
Cairn (Chukho)						

	Sub-type	Paomei	Donmai	Yumai	Ramai	Total
	Chukho Neisa C'hukho (Small caun)	1	1	1	1	**4**
Dolmen (Raikhubu)		10	15	12	9	46
Stone Circles	Papao chukho	1				1
(name after the	Pahon chukho			2		**2**
respective clan)	Paona chukho		2			**2**
	Seva chukho				3	3
	chuchukho			1		**1**
Monolith (Chadeichu)		1				1
Horizontal	Sheibechu	1				1
flat stone	Khopochu	29	17	31	26	103
		117	**119**	94	**103**	**433**

The field investigations were carried out into the megalithic cultures found among the Poumais of the Saranamei village in Senapati district. On the basis of the present study, the various megalithic types found among the Poumais of Saranamei village, are broadly divided into two groups. The first group constitutes the morphological type while the second group consists of the functional type.

On the basis of the morphological types, the megalithic monuments of this village are broadly divided into six groups again. These include flat stones or cap stones, menhir, alignments and avenue; cairns (with or without stone circles), stone circles, dolmens and stone seats.

Functionally, the megalithic monuments of this village are divided into five groups *viz.,* memorial stone, seats/resting stone; watch tower, religious stone and grave stone.

In order to explain the significance of various megaliths of Saranamei village, the rude stone monuments are divided into two groups: a) Memorials and commemoratives or menhirs of social status and b) Funerary and ritualistic megaliths.

In Manipur, mainly among the Poumais this prehistoric and dead cultural phenomenon could be observed as living culture, as they used to perform this stone raising ceremony every year by the villagers, thus the number of megaliths also increases every year.

Megalithic types found in the Saranamei village, Poumai areas of Manipur are smaller than the neighbouring areas of Maos, Marams, Liangmais and Zemes, but larger than the Anals, Kabuis, Koirengs. Marings, Tangkhuls and Thangals. The dominant structure of the area are menhirs, alignments, avenues, dolmens and cairns. In

addition to this the seating or resting stone forms a constituent part of the megalithic field in the Poumai areas.

MEGHALAYA

42. Exploration in District West Garo Hills

The Guwahati Circle of the Survey and the Directorate of Art and Culture, Government of Meghalaya, carried out explorations in the Rangram-Ganol river valley of West Garo Hills (90° 15' E; 25° 33' N) under the guidence of G.C. Chauley, in collaboration with S.P. Marak, of the District Museum, Tura, T.C. Sharma and Sukanya Sharma, the technical collaborators of the project. The exploration team was successful in locating several Stone Age sites on the hill ranges starting from Selbalgiri village and extending to a distance of about 6 km upto Michimagiri and Bibragiri villages. Altogether five Stone Age sties, exposed due to cutting were found with large quantity of stone axes. Some of the sites in this area were also exposed during the construction of a road along the hill slopes and some of the sites thus exposed were found to contain stratified deposits of large quantity of Stone Age artefacts.

All the antiquities collected by the team consist of chipped stone axes, scrapers, points, blades, cores along with ground and polished stone axes. These were handed over to the District Museum, Tura, Garo Hills, Meghalaya.

ORISSA

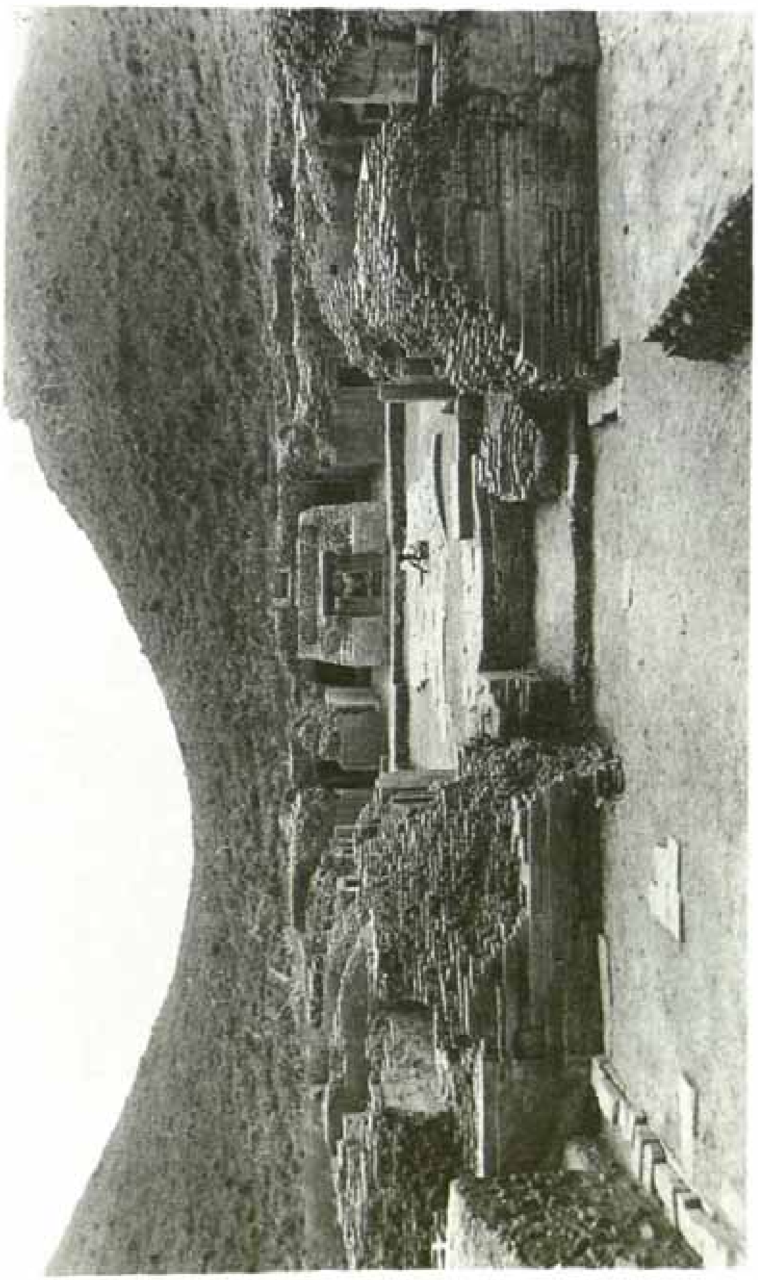
43. Excavation at Udaygiri-2, District Jajpur

In continuation of the previous year's work *(1997-98, pp.* 136-144), the Excavation Branch-IV, Bhubaneswar, of the Survey, undertook excavation at Udaygiri-2, under the direction of Bimal Bandyopadhyay, assisted by A.K. Patel, P.K. Patel, P.K. Dikhit, G.L. Katade, S.K. Dey, S.K. Khuntia, B.B. Badamali, R.N. Sahoo and S.K. Bhoi. The objectives of this year's work were to reveal the plan of the monastery which was partially exposed last year as also to distinguish the constructional phases.

After clearing thick vegetation, twenty trenches numbering A2, A3, A4, A5, A6, XA2, XA3, XA4, XA5, XA6, XB3, XB6, XC2, XC3, XC4, XC5, B5, C5, D5 and YC2 were undertaken for excavation. Out of these trenches, A4, XA5, XA6, XB6, XC4 and XC5 were partly excavated during the last year. It was already confirmed that the monastery had a square plan covering an area of 30 m square (pl. 48). The outer facing of the southern wall of the monastery had *pancharatha* projections (pl. 49). The cells were arranged on all sides of the courtyard with a passage verandah in front of cells. The main sanctum was provided with 1.4 m wide ambulatory passage. In addition, south-west corner of the passage verandah, western part of courtyard and one cell were exposed during the last year's work.

Excavation in the Trenches XA3 and XB3 revealed the frontal passage to the monastery and base of the elaborate gate on the northern side. Evidently approach to the monastery was paved with stone blocks, majority of which were missing. Before the gateway, in both sides of wall, elegantly carved niches were provided which were 7.50 m apart from one another. On the eastern niche, an image of Hariti was found *in situ* measuring 80 X 42 X 28 m (pl.50). The seated *yakshi* holds a *modaka* in her right hand while the other hand is

Plate 48



Udaygiri - 2 : front view of the excavated monastery

Plate 49



Udaygiri - 2 : southern back side wall with pancharatha projection

Plate 50



Udaygiri - 2 : in situ image of Hariti on the eastern niche

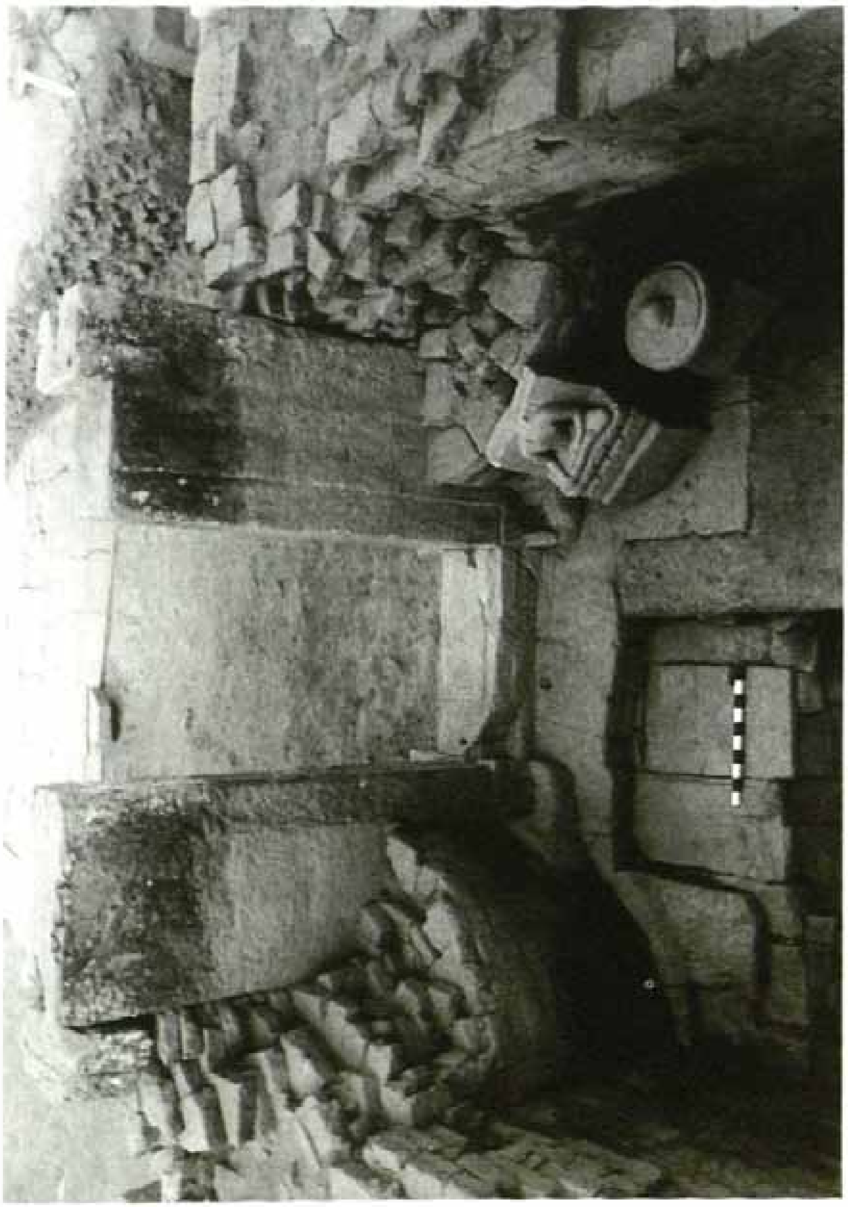
placed over the left lap where the badly mutilated figure of a child appears. The image in its figural composition, fine ornaments and elaborate headdress exhibits chaste beauty. The main gate of the monastery was missing but the holes for fixing the gate on the stone blocks with iron dowels suggest its provision and details of the gate are also available in the references to the site by earlier explorers who visited the site in the nineteenth century. According to the available evidence, it has been housed in the Patna Museum.

The main sanctum was cleared during the last season's work but a 2.30 m long and 38 cm thick lintel was found collapsed inside the sanctum. It was removed from the sanctum and debris below was cleared. It was noticed that semicircular pilasters were provided in the north-east and north-west corners of the sanctum to support the heavy lintel. The floor of the sanctum was provided with stone slabs above two courses of brick soling. Below it rammed blackish *murram* with stone boulders was provided on natural surface. A passage was also provided to drain out water from the sanctum, outlet of which could not be ascertained yet. One headless image of Buddha in *bhumisparsa-mudra* measuring 38.8 X 37.5 X 22 cm and a *chhatra* with geometric and floral design (dia 36 cm and height 14.4 cm) were kept on stone blocks near the pilaster in north-east corner, apparently a later addition (pl. 51).

In conformity with other monasteries in this part of the country, the cells of this monastery were also arranged on all sides of the courtyard, four on south, three each on the east and west and three on north (pl. 52). For proper documentation, cells have been numbered from 1 to 13. Cell 1 on the right side of the entrance of the monastery whereas Cell 13 on the left. Floor area of the cells which was more or less 2.90 X 2.75 m had minor variations. It consisted of random brick laying, sometimes traces of rammed brick soling noticed. The walls were quite high mostly exposed in proper shape. On the inner side of the walls of some of the cells, recess for lamp and a niche were provided either for keeping personal belongings or a deity for worship. Entrance to the cell was provided through a low height door measuring 1.4 m parts like lintel, jambs, sills of which were built of stones. Advanced architectural skill was noticed in formation of 2 m high, 1.44 m long and 1.70 m wide arches on the making of windows placed over an unusually high loft. Apparently, the roof was constructed of bricks with layers of soling above, placed over wooden rafters. It appeared from the excavation that at a certain period during occupation, some of the ground floor cells were abandoned probably because being unable to take up large-scale repairs, the inhabitants preferred to close the cells. Curiously, the windows of all the cells were closed both from inside and outside by masonry walls and along with windows, lofts were also closed in Cells 11 and 12. Two cells on the northwestern side had a common entrance from outside making a departure from general formation of cells as all other cells had a single door for each of them providing approach from corridor. The inner cells of this too had a secret chamber on its wall facing east. The secret chamber (38.5 X 75 X 98.5 cm) was provided with a door also. This cell was provided with a niche of corbelled ceiling at the entrance.

Passage verandah running through all sides in front of the cells was 2.4 m wide made with rammed-

Plate 51



Udaygiri - 2 : view of sanctum-sanctorum (northern half)

Plate 52



Udaygiri - 2 : courtyard and cells on eastern side

brick above the *murram* with boulders and brickbats. In south-west corner of the passage, i.e., in front of Cells 6 and 7, a raised brick pavement was partitioned into two halves by a brick wall. On the passage verandah, at the corners of Cells 3, 4, 10 and 12 stone bases were provided, out of which, at the corner of Cell 3, a pillar was found *in situ* suggesting that the verandah also had a roof supported by stone columns. A large number of terracotta tiles unearthed from the courtyard suggested probable use of them for construction of the roof.

The kerb which elsewhere separates the passage verandah from the courtyard was missing here. The courtyard consisted of paved stone slabs of which majority were missing. The courtyard had a slope towards north-east corner of the monastery where a drain passed through Cell 13 and emerged outside the monastery. The stone drainage (20 cm in width and 39 cm in depth) was covered with slabs of irregular shape.

On the northeastern corner instead of a cell, provision of a flight of steps was made providing approach to the first floor (pi. 53). The steps were 1.32 m wide and each step had risers of 13 to 20 cm and treads of 24 to 26 cm.

In the north-east corner outside the monastery, several brick structures were exposed. One L-shaped retaining wall was provided to give support to east corner over the wall of the monastery. Another circular structure with a radius of approximately 1.9m having one course of brick was exposed which was provided with stone slabs all around, probably this represents the remnants of a stupa. An open stone drain was found starting from this circular structure. Other brick structures included wall constructed by superimposing on one another, out of these a wall running north-south with thickness of 96 cm was provided with four stone slabs measuring 71 sq m, each kept at a distance of 1.65 m from another. The association of these structures with the monastery could not be asscertained yet. Most probably these structures belonged to an early phase at the site.

The area on the eastern side of the monastery where a trench was laid towards the edge of the mound yielded foundation of a stone structure measuring 7.25 X 5.90 m. This structure was partitioned into two parts by a 1.05 m thick wall. This structure made of haphazardly collected stone blocks yielded some beautifully carved architectural members with figures of both divine and semi-divine beings, hi front of this stone structure towards north, an irregular paved brick floor was also noticed. The existence of such a large number of exquisitely carved architectural members on this spot and elsewhere in the site points to the construction of temples at the site almost contemporaneous to the monastery. However, in all likelihood, they were razed to the ground and at a much later date a feeble attempt was taken to form some sanctum using the remnants.

With a view to trace the link between the monastery and the area on the north-west of the mound where an assemblage of votive stupas was noticed, a trench was dug which revealed remains of a small sanctum measuring 1.42 X 2.02 m on a 2.22 m thick wall running east-west. This sanctum was provided with a stone pedestal (1.36 X 0.60 m) made of two stone slabs fixed together with iron dowels. It seems that the 2.22 m thick wall mentioned above was the part of a large brick structure.

Besides the image of Hariti datable to *circa* eight-ninth century AD, found *in situ,* this year's excavation yielded host of antiquities which included Buddha and Bodhisattva heads (pl.54), headless Buddha, miniature chlorite image, miniature stone

Plates 53-54



53



54

Udaygiri - 2 : 53, flight of steps leading to first floor and 54, Buddha and Bodhisattva heads

Plates 55-56



55



56

Udaygiri - 2 : 55, inscribed terracotta tiles and 56, fragmentary stone inscription

Ganesa, bust of divinities, *naga-dvarapala,* inscribed terracotta sealings, inscribed terracotta tiles (pl.55), inscribed stone slabs (pl.56), inscribed potsherds, terracotta, silver, copper and iron objects, etc. Some of the architectural members in stone with exquisite carving deserve special mention. The antiquities found form the excavation mostly belong to *circa* eighth century to twelfth century AD.

Pottery included mainly of two wares, i.e., grey ware and red ware and the main shapes were jar, small vases, high-necked pots, bowls, sprinklers, miniature pots, lamps, dishes, basins, carinated *handis,* large storage-jars, etc.

Some sherds of micaceous red ware were also found in which the main shape was globular pots. Bulk of the pottery was wheel-made, well-fired and had some decorations like triangular notched designs on rim and parallel incisions on shoulders of pots and *handis.*

44. EXCAVATION AT MAHAKALA TEMPLE, RATNAGIRI, DISTRICT JAJPUR

In continuation of the previous year's *(1997-98,* p. 280) work, periperal area of the dismantled Mahakala Temple was taken up for further archaeological operation with a view to check and know the spread of archaeological remains underneath the site. Accordingly, the area of operation has been extended towards the east-west axis.

In addition to the brick stupa exposed during the previous year's *(1997-98,* p.280) work, another small stupa to the north-east of the big stupa mentioned above, was encountered at a distance at about 30 cm. Since, the major portion of the stupa is embedded in the section, its exact dimension is not known. So far ten courses of brick have been exposed. However, from the limited digging, it appears that the extant diameter of the stupa is 1.25 m (approximately). The area under question needs further digging.

It may be mentioned here that two large Buddhist sculptures have been unearthed in front of the main brick stupa. The said sculptures are still *in situ.* But the base level was not exposed in order to ascertain the *in situ* nature of the sculptures and their bases, earth clearance work was taken up.

During the clearance work, the base level of sculptures as well as sanctum made out of dressed stone block was revealed. It is observed that the colossal image of Avalokitesvara stands on the rear wall of the sanctum. This small structure of the sanctum measures about 1.77 X 1.00 m. It is facing north-east-west, measures 1.00 m and north-south, it is 1.77 m. Due to non-availability of space, the plinth level of sanctum could not be dug. The western wall of the sanctum (inside) was found with a small sculpture of Buddha in *bhumisparsa-mudra.*

Besides there is a flight of stone steps, consisting of thirteen steps towards the west side of the dismantled temple. The flight of step resets over the natural soil. It is in-between the two brick walls.

Among the other structural remains, the random brick wall and paved floor were encountered which are apparently constructed by re-utilizing the earlier bricks available there.

However, from the scientific clearance work, it becomes clear that the Mahakala Temple cannot be re-erected at the same place, as the area contains rich archaeological vestiges.

45. EXPLORATION IN DISTRICT KHURDA

A reconnaissance survey work was carried out on the right bank of River Mahanadi, by P.K. Dikhit, G.L. Katade, S.K. Khuntia and R.N. Sahoo of the Excavation

Branch-IV, Bhubaneswar, of the Survey, under the direction of Bimal Bandyopadhyay and A.K. Patel. The following archaeological remains were brought to light.

		Nature of remains
Bagheitangi (near Baunsa Bana)	(20° 16' 09" N; 85° 34' 00" E)	Partly disturbed mound yielding grey and red ware of medieval period
Bauti (ruined temole site)Kuaputa	(20° 17' 16" N; 85° 34' 05" *E)*	Ruined temple with sculptures *of gaja-sardula,* and other architectural members of medieval period
Dahula Dhipa Nuaparha	(20° 15' 24" N; 85° 35' 37" E)	Disturbed mound yielding grey ware and red ware of medieval period
Fakirpada (Bantala Reserve forest)/Doriha	(20° 15' 17" N; 85° 34' 54" E)	Disturbed mound yielding grey ware, red ware and dull red ware of medieval period
Gadibara/Mallipur	(20° 14' 03" N; 86° 36' 10" E)	Disturbed mound yielding grey and dull red ware of medieval period
Garh Haladia	(20° 16' 53" N; 85° 34' 24" *E)*	Ruined temple in *panchavatana* style and sculptures of Hanuman. Ganesa. Kali and *navagraha* panel, etc
Ghodadhipa/ Balisahi	(20° 16' 00" N; 85° 83' 58" E)	Disturbed mound yielding grey and dull red ware of medieval period
Rahula Dhipa Muktapur	(20° 15' 29" N; 85° 35' 00" E)	Disturbed mound yielding grey ware and red ware of medieval period
Senaka Padia Kuaputa	(20° 17' 16" N; 85° 34' 05" E)	Disturbed mound yielding red ware and grey ware of medieval period
Talagarh Baunsaputa	(20° 15' 24" N; 85° 35' 37" E)	Mound having grey ware and red ware of medieval period

46. Exploration in Redhakhol, District Sambalpur

Arakhita Pradhan explored the southeastern part of Redhakhol (Rairakhol) tehsil in District Sambalpur and reported seven important archaeological sites *viz.,* Asurgarh, Bhima Mandali, Deulgaon Ushakothi, Belaghati Goja, Chhatagarh, Parabhadi and Sandhbalda. Out of these sites, the site Asurgarh is a fortified habitational site of Chalcolithic and early Iron Age cultures and the remaining six are prehistoric rock-art sites.

Asurgarh (84° 03' 40" E; 20° 06' 20" N), lies on the left bank of Harihar Jor (a tributary of Mahanadi) in Badmal village. A mud fortification wall of about 20 m width on all four sides encloses the site. Outside the fortification there is evidence of moat on north, south and east. The fortification measures 240 m in south, 200 m in north, 170 m in east and

185 m in western arm. The surface finds include sherds of red ware, red-slipped ware, black-slipped ware besides black-and-red ware, etc. The other finds include stone objects like ring stones, fluted cores and flakes of chert, charred bones and iron slag.

Bhima Mandali (84° 03' 55" E; 20° 11' 48" N) lies on the right bank of Champali river (a tributary of River Tikra) in Kalapat hill range of Landimal Reserve Forest. Sixteen rock-shelters of different dimensions, formed out of grey sandstone have been located. These shelters are located in different orientation and vary in size. The smallest one measures 3 m in length and 2 m in width and the largest being 5 5 m in length, 3.5 in width and 7 m in height. Out of these sixteen shelters, engravings are executed on the walls of three rock-shelters (No. IV, VII and VIII B) and a single specimen of painting is traced in shelter No. IX. The engravings of Bhima Mandali are geometric and naturalistic in nature having some resemblance with Vikramkhol engravings (in Jharsuguda district). The engraved figures include two foot prints, a palm, four animals, few plants, wavy lines, crescent, triangles, triangles with dot inside, double triangles, oval, oval with dot or vertical stroke inside, circle, zig-zag line, oblique line, bracket, dash, vertical stroke and square etc. The grooves of the engravings were originally filled in with a paste of red ochre. Discovery of six grinding holes in Shelter IV and seven grinding holes in Shelter VII and some cores and microliths in chert indicate the antiquity of these engravings as early as Mesolithic and Neolithic periods.

Deulgaon Ushakothi (84° 40' 15" E; 21° 10' 00" N) is situated in Deulgaon hill range, 7 km south-east of Hitasara village and 10 km south-east of Batgaon in Naktideul police station of Redhakhol tehsil. The rock-shelters of this site are formed out of sandstone with bands of various colours like yellow and grey. Three rock-shelters of this site are adorned with rock engravings. The shelter Ushakothi I measures 20 m in length, 7 m in width and 6 m in height and bears more than hundred specimens of engravings. The engravings include figures like triangle, triangle with dot or vertical stroke inside, wavy lines, zig-zag lines, circles or ovals with or without dot, square with dot, eleven animal figures including deer, tiger and cattle, two lizards and an intricately decorated semicircle. While depicting animal figure, the body is totally engraved unlike providing outline only as in the case of Bhima Mandali. The grooves of engravings were most probably filled in with paste of ochre, yellow and black

Ushakothi II bears a few signs like circles and ovals only.

Ushakothi III measures 30 m in length, 9 m in width and 8 m in height and its wall bears a few specimens of engravings like ovals, ovals with dot inside, triangles, wavy lines, an animal and two probable birds. A polished stone celt, many microliths and hand-made potsherds found here suggest the antiquity of these engravings to atleast Neolithic time.

Belaghati Goja (84° 41' 00" E; 21 ° 09' 08" N) is a single rock-shelter site which measures 60 m in length and 4 m in width. This rock-shelter contains a few engraved animal figures.

Chhatagarh (84° 27' 20" E; 21° 04' 45" N) lies in Chhatagarh Pahar, which is situated 12 km east of Redhakhol. The rock-surface of Chhatagarh-I is adorned with three specimens of paintings in red colour and eight specimens of engravings filled in with a paste of red ochre. The painted figures include a crude depiction of an animal whereas the engraved figures include a set of triangles with the base to the top and symbolic representation of a human being and a plant.

Parabhadi (84° 36' 06" E; 21 ° 04' 10" N) with a single shelter lies on the bank of Aunli jar (a tributary of the River Brahmani). The wall of this shelter bears a few geometric symbols like triangle with dot inside and semicircle. Besides, there are eighteen grinding holes on the rock floor.

Sandhbalda (84° 35' 32" E; 21 ° 03' 52" N) with a single shelter lies about 1.5 km south-west of Parabhadi on the left bank of Aunli jar. The rock wall of this shelter contains few cup marks in a linear pattern and few engravings in the form of oval with a dot inside.

In addition to the above discoveries in Redhakhol tehsil remains of hero-stones and sati-stones datable to medieval period are also found at Putulaghati (84° 31'56" E; 21° 03'34" N).

47. EXPLORATION IN DISTRICT SONPUR

In the course of Archaeological reconnaissance survey carried out by P.K. Dikhit, G.L. Katade, B.B. Badamali of the Excavation Branch-IV, Bhubaneswar, of the Survey, under the direction of Bimal Bandyopadhyay and A.K. Patel, rock-shelter sites, namely, Chandili (21°03'35"N; 83°41' 10" E) and Chanabera (21 ° 03' 09" N; 83° 41' 10" E) were discovered. One of the hillocks locally called as Ushakothi bear paintings in red pigments. The paintings depict both human and animal figures (bull, bison, etc.) comparable to paintings of mesolithic period.

PUNJAB

48. EXPLORATION IN DISTRICT ROPAR

The Department of Cultural Affairs, Archaeology and Museums, Government of Punjab, Chandigarh, has conducted village - to - village survey in Kharan, Kharar, Majri, Morinda and Ropar tehsils of District Ropar and noticed the following antiquarian remains.

Tehsil	*Village/She*	*Nature of remains*
Kharan	Bakarpur	Medieval
do	Bari	Harappan
do	Basia Brahmana	Medieval
do	Chooti Chapar Chiri	Medieval
do	Cholta Kalan	Medieval
do	Cholta Khurad	Medieval
do	Dabali	Medieval
do	Deh Kalan	Medieval
do	Gabe Majra	Medieval
do	Jheewar heri	Medieval
do	Kailon	Harappan, Sunga-Kushan and medieval

Tehsil	*Village/Site*	*Nature of remains*
Kharan	Kambala	Muslim
do	Kandala	Medieval
do	Kurara	Harappan, PGW, Sunga-Kushan
do	Kurari	Harappan, PGW
do	Majat	Medieval
do	Malak Pur	Medieval
do	Mehmoodpur	Medieval
do	Pannua	Medieval
do	Patton	Medieval
do	Popana	Medieval
do	Premgarh	Grey ware
do	Rangjan	Medieval
do	Rasan-Heri	Medieval
do	Tangori	Harappan, PGW, medieval
do	Vadali	Medieval
do	Vadi Chapar Chiri	Medieval
Kharar	Alahpur	Medieval
do	Bairampur	Medieval
do	Baroli	Medieval
do	Bath-lana	Medieval
do	Bhago-majra	Medieval
do	Bhajauli	Muslim
do	Chatamala	Medieval
do	Chilla	Medieval
do	Chudiala	Medieval
do	Dhilpur	Medieval
do	Garanga	Medieval

Tehsil	*Village/Site*	*Nature of remains*
Kharar	Gharuan	Medieval
do	Gige-majra	Medieval
do	Gudana	Medieval
do	Kalheri	Muslim
do	Khanpur	Grey ware, Kushan
do	Kumbra	Medieval
do	Lakhnour	Muslim
do	Lamdra	Medieval
do	Machhlikalan	Muslim
do	Majatari	Medieval
do	Makaran	Muslim
do	Mamupur	Muslim
do	Manouli	Muslim
do	Mouli	Medieval
do	Nada	Medieval
do	Nagalian	Muslim
do	Nanherian	PGW, Kushan, medieval
do	Nano-majra	Medieval
do	Pacci Rurki	Medieval
do	Padiala	Muslim
do	Pir Suhana	Muslim
do	Radiala	Muslim
do	Raipur Chhota	Medieval
do	Raipur Kalan	Medieval
do	Sahoran	Medieval

Tehsil	Village/Site	Nature oj remains
Kharar	Saidpur	Medieval
do	Sakrulapur	Medieval
do	Sanbhalkhi	Medieval
do	Soneta	Medieval
do	Shampur	Medieval
do	Sil	Medieval
do	Silkapra	Medieval
do	Simbalpur	Muslim
do	Slamatpur	Harappan
do	Sohana	Medieval
do	Sotal	Muslim
do	Suhara	Medieval
do	Tior	Medieval
Majri	Ghandoli	Medieval
do	Jandpura	Muslim
do	Kachi Rurki	Medieval
do	Sialwan Majri	Medieval
Morinda	Bajheri	Medieval
Ropar	Bhadal	Medieval
do	Fatehgarh	Medieval
do	Gandho Bari	Medieval
do	Gochar	Medieval
do	Guno-majra	Medieval
do	Kansala	Medieval
do	Khizrabad	PGW
do	Mianpur	Late medieval

Tehsil	*Village/Site*	*Nature of remains*
Ropar	Bhadal	Medieval
do	Sagari	Medieval
do	Siasatpur	Medieval
do	Singh Bhagwantpura	Harappan, PGW
do	Tarauli	Medieval
do	Vadi Jhingra	Medieval

RAJASTHAN

49. Exploration in District Alwar

This prestigious primordial site of Alwar is situated in the heart of the Bamboo and Dhok forests possessing herbs and shrubs, mammals and birds, having perennial water springs, natural well cavity in rocks, step-well and the rock-shelters was explored by J.S. Bakshi of the Matsya Heritage and Environment Trust, Alwar. The presence of primogenative habitats are established on account of hundreds of rock paintings found in these rocks. In accordance with the established choice of the primitive man those rocks are not of much height. Most of these rock paintings are in red colour and very few are in white colour. Quite a good number of these primitive art are also hand scraped work made with the help of sharpen stone tools. The other facet established on the basis of these local rock paintings is that they were not aware of cultivation, cotton and wheel. According to the paintings they worshipped sun, hunted with stone and arrows. These depict single or in pair of human with children, deer, four - or twelve-horned deer, *Neel Gai, Suar* (Wild bore), also, some other bird, dots, oval shape, geometric and abstract figures, *svastika,* whrilpool, flower, *om, trishula, damaru,* elephant and fish etc., There is a brush painting, either of the tribal head or of its *ojha.* This is the only image dressed in beard, head covered, wearing perhaps leather vest and a necklace with a big pendant possibly made of stone.

There are also ruins of the historical fort of Nikumbh Kshatriyas of ninth century in the vicinity. This clan is believed to have later constructed the Bala Fort of Alwar in eleventh century AD.

50. Exploration in District Banswara

The survey in Ghatol tehsil was conducted jointly by Jeewan S. Kharakwal of Rajasthan Vidyapeeth, Udaipur and S.S. Garhia of the Geological Survey of India, Jaipur and over two dozens ancient mining and a smelting site were discovered.

Bhukia is located about 17 km north-west of Ghatol on the bank of a seasonal rivulet, a tributary of the River Mahi. An iron-smelting site was discovered in the village, which is locally known as Mahadev-ji-ki-Dungri. The site, spread over an area of two acres, has a thin cultural deposit measuring 80 cm. A circular structure (dia 21 m) located in the central part of the site was made of a locally available stones and burnt bricks, the dimension of which ranged from 37 X 23 X 7 and 35 X 20 X 6 cm. The stones,

outlined by bricks, appear to have been aligned in a circular fashion, and inside this feature considerable amount of slag, few potsherds, charcoal and fragment of iron chisel were found. Iron slag found sticking to the inner face of stones apparently suggests that they were used as refractory. Hence this feature was identified as a smelting furnace, though no retorts were found. Three conical pits excavated in the marble exposure were found at the site. Their diameter and depth were measured 22,24, 35 cm and 15,15,26 cm respectively. A similar depression (dia 27 cm) was also found in a dressed rectangular stone slab of quartz (75 X 35 X 11 cm). It is partly broken and now installed in the Mahadeyji Temple by the villagers. The inner surface was polished perhaps because of prolonged grinding. The villagers recount that initially this slab was lying near these circular pits.

A small amount of pottery, iron ore and several heaps of slag were noticed lying around the above structure. The ceramic assemblage comprised red and grey wares and represented by medium size globular jars with a variety of everted rims, bowls with flared sides and disc-type base and spouts. The grey ware jars were decorated with a band of incised parallel lines on the shoulder portion. The assemblage was made of fine clay to which sand was added as tempering material. It was fired at high temperature, as the oxidised core would indicate, in case of red ware. The assemblage is datable to medieval period. Besides pottery, two ring stones of basic rocks and few chert flakes were also found at the site, which certainly indicate that this terrain was also occupied by microlithic cultures in remote past.

Several ancient mining sites ranging from 2 to 10 m deep and 4 to 50 m long were noticed at Khanwals in Bhukia. It appears that ore/gossan was first ground in saddle querns and then dry and wet floatation was carried out. In coarse of time as a result of this process a huge amount of soil was dumped around, as several such heaps, circular on plan and with depression in the middle, and saddle querns were discovered. One such dump was measured 35 m in diameter and 2 m in height. One may even measure the phases of dumping. What is interesting is that both gold and iron ore was perhaps extracted from the same mines as the occurrence of arsenopyrite in these mines was confirmed by the Geologists of the Geological Survey of India, working in this area for gold extraction. The heaps of soil were perhaps the result of gold mining. The iron ore was perhaps carried away to the smelting site of Bhukia.

51. EXCAVATION AT LACHHURA, DISTRICT BHILWARA

The Jaipur Circle of the Survey, conducted excavation at Lachhura, under the direction of B.R. Meena, assisted by S.C. Saran, Kanwar Singh, B.R. Singh, S.C. Gupta, R.P. Mathur, V.K. Uppal, Gulzar Singh, S.K. Apharya and yielded a seven metre thick deposit.

The village Lachhura (26° 24' ; 77° 53') is situated about 55 km west of the district headquarter of Bhilwara and 18 km south-west of the tehsil headquarter Asind in Rajasthan. The ancient mound is situated half a kilometer to the north of the present village, on the bank of a seasonal *nala.* Locally known as Hanuman *nala,* is an affluent of the River Mansi, a tributary of River Banas. The ancient mound originally covered an area of about 250 m north-to-south and about 200 m east-to-west but today only 140 X 130 m area is intact. Presently, almost the whole mound except a little portion at north, is under cultivation.

Trench A laid in the northwestern part of the mound where the digging was done down to a depth of 1.75 m yielding a thin layer of hard *kankar.*

Another Trench B was laid further north to the Trench A showing a thick deposit of sharp-edged Sunga bowls, lying on the natural soil.

Trench C was laid in the northeastern part, close to straight cliff on the bank of seasonal *nala.* It was dug down to the virgin soil to determine the thickness of the occupational deposit, stratigraphy and cultural sequence of the site. Fourteen layers were identified in this trench and habitational deposit could be traced over a thick and very hard *kankar* bed. The entire deposit is divided into four periods, on the basis of pottery and antiquities, as given below.

Period I (c. 700-500 BC) with a deposit of 1.7 m layers (14) and (13) yielded terracotta human figurine, ear-studs, skin-rubbers, wheel, net-sinkers, beads of terracotta and carnelian, bangle, kohl stick and lumps of copper, hammer stone, sling balls etc. The presence of black-and-red ware with copper also indicated that the deposit is of chalcolithic period.

The human figurines are found one each from layers (14) and (13). The figurine found in the lowest layer is crude while other one is comparatively well formed. Its right hand is straight whereas left hand is slightly turned with a pedestal base.

The black-and-red ware pots are of fine quality with shining burnished surface. Dishes with featureless rim and slightly incurved sides are most common types. The pots are of fine quality and mostly with thin section and well-burnt. Dish is the main shape besides a few bowls having inturned rims, with convex or straight sides and sagger base.

Grey ware is represented by a few sherds of thin grey ware. As the sherds were too small, it was difficult to make out the exact shape. Besides, a few sherds of black-slipped ware are also present. Red ware is the main associated ware and found in large quantity. Pots of red ware are of unslipped variety. Main shapes are bowls, vases and lids.

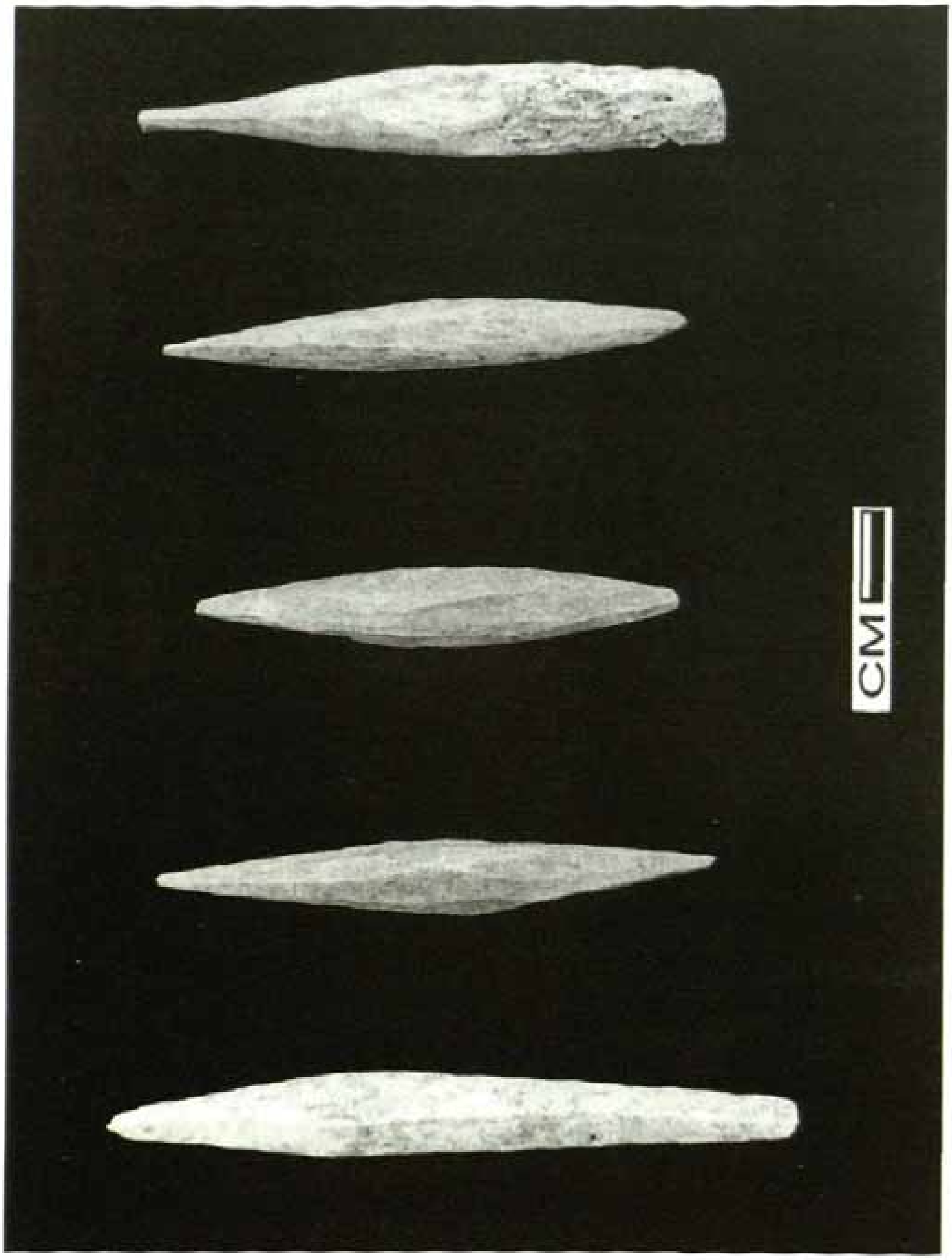
Thick deposit of burnt and baked clay lumps bearing impression of bamboo and reads on the inner surface in layer (13) throw some idea about the structures of this period. The houses of this period were made of wattle-and-daub with thick mud-plaster on walls and thatched roof made of bamboo.

About 1 m thick deposit of layers (12) and (11) is classified as Period II (c. 500-300 BC). Antiquities from this period include animal figurine, skin-rubbers, net-sinkers, bead, ear-studs, bangles, bone point and a bead of carnelian. Two terracotta animal figurines found in this period are quite big. One of the figurines appears to be a horse with its head and legs broken. The other animal figurine has two hump-like projections on back, and the third one is of a bull, in smaller size. Its head is broken but the remaining body portion is easily identifiable. Terracotta net-sinkers of various shapes and size and bone points are also present (pl.57).

Red ware is the only pottery found in this period. Pots of red ware were unslipped, having rough exterior. It is in medium fabric with a dull appearance. The common shapes are bowls, vase, storage-jar, basin and lid. The presence of some small sherds of grey ware and black-slipped ware mark the continuity in this phase, although the number is very limited.

About 1.80 m deposit from layers (10) to (7) represents Period III *(c.* 300-100 BC). Terracotta female figurine found in this deposit is a fine piece of

Plate 57



Lachhura : bone points

art showing only the bust. The hands were curved with palm perhaps resting on waist, in *katyavalambita* pose and sitting in *lalitasana.* A terracotta head with broad lips, open mouth, big nose and hair tied artistically also forms a noteworthy find.

A terracotta sealing with four Brahmi characters is an important find. On the palaeographical ground it is assignable to the third century BC. Three letters, *se na* and *sa* are in a line whereas the fourth one, *ma* is written above between *se* and *na.*

The pots are mainly of coarse red ware, although a few pots were found with a fine red slip. Bowl, vase, basin and storage-jar continue to occur as common shapes.

The uppermost deposit of 1.85 m from layers (6) to (1) is marked as Period IV (c. 100 BC - AD 200). Various objects made of terracotta, stone and iron besides pottery are reported from this deposit. A terracotta figurine of bird partly broken bears a deep hole on its base, perhaps to fix it on a stick. The other terracotta objects comprise sealing with a symbol, humped bull and lower part of a moulded plaque showing two legs, wearing a long drapery and boots. Besides iron nails, rings and knife are also present.

The ceramic industry of preceding phase, i.e., red ware also continued with the main shapes such as deep dish, bowls, vase, carinated *handi,* lids and basin. Pottery is generally ill-fired having poor surface treatment and coarse in texture. The exterior surface of pots are coarse and some of the sherds have fine red slip. A few sherds of stamped ware are also present.

52. EXPLORATION IN DISTRICT JHUNJHUNU

In the course of village-to-village survey, B.R. Singh of the Jaipur Circle, of the Survey, noticed the following sites of archaeological interest.

Tehsil	*Village/Site*	*Nature of remains*
Jhunjhunu	Nand (28° 9'; 75° 17')	Ruined Haveli of late nineteenth century AD.
Udaipurwati	Bajawa (27° 68'; 75° 29')	Historical mound

53. EXPLORATION IN DISTRICT TONK

During the course of exploration along the River Banas from Tonk to down stream, the Jaipur Circle of the Survey, under the direction of B.R. Meena, assisted by Kanwar Singh, discovered the following sites:

Village/Site	*Nature of remains*
ArniyanTiwari (26° 10'40"; 75° 54')	Early historical site, step-well (eighteenth century)
Banetha (26° 04' 40" ; 75° 59' 36")	Temples (thirteenth-fifteenth century), ruined fort (eighteenth century), step-wells, memorial stones, watch towers, sari-stones and *chhatris*

Village/Site	*Nature of remains*
Chironj (26° 12'; 75° 52" 55")	Setp-well (eighteenth century)
Churiya (26° 08'; 75° 58")	Early historical site
Devli (26° 11' 12"; 75° 54' 49")	Early historical site
Gaddi (26° 11'05"; 75° 59'42")	Medieval period mound
Hadi Kalan (26° 14' 56"; 75° 49' 24")	Step-well (seventeenth-eighteenth century)
Hatona (26° 13'54"; 75° 54'41")	Early historical mound
Kakraj Kalan (26° 13'40"; 75° 47'30")	Step-well (late eighteenth century)
Kaririya (26° 08' 23'; 75° 57' 36")	Early historical site
MuktyarNagar (26° 11' 16"; 75° 59' 32")	Microliths, early historical site
Sarai (26° II[1]56"; 75° 50'54")	Sarai (nineteenth century)
Sawai (26° 09' 36"; 75° 55' 07")	Early historical site
Sheopuri (26° ll'21";75°5r 13")	Siva Temple and Dargah
Sohela (26° 13' 40"; 75° 50' 12")	Medieval mound

54. EXCAVATION AT BALATHAL, D.STRICT UDAJPLR

In continuation of the earlier work *(1993-94,* pp. 93-97; *1995-96,* pp. 64-70; *1996-97,* pp. 90-100 AND 1997-98, PP. 145-15), digging was begun by V.N. Misra, Vasant Shinde and R.K. Mohanty of the Deccan College Post-graduate and Research

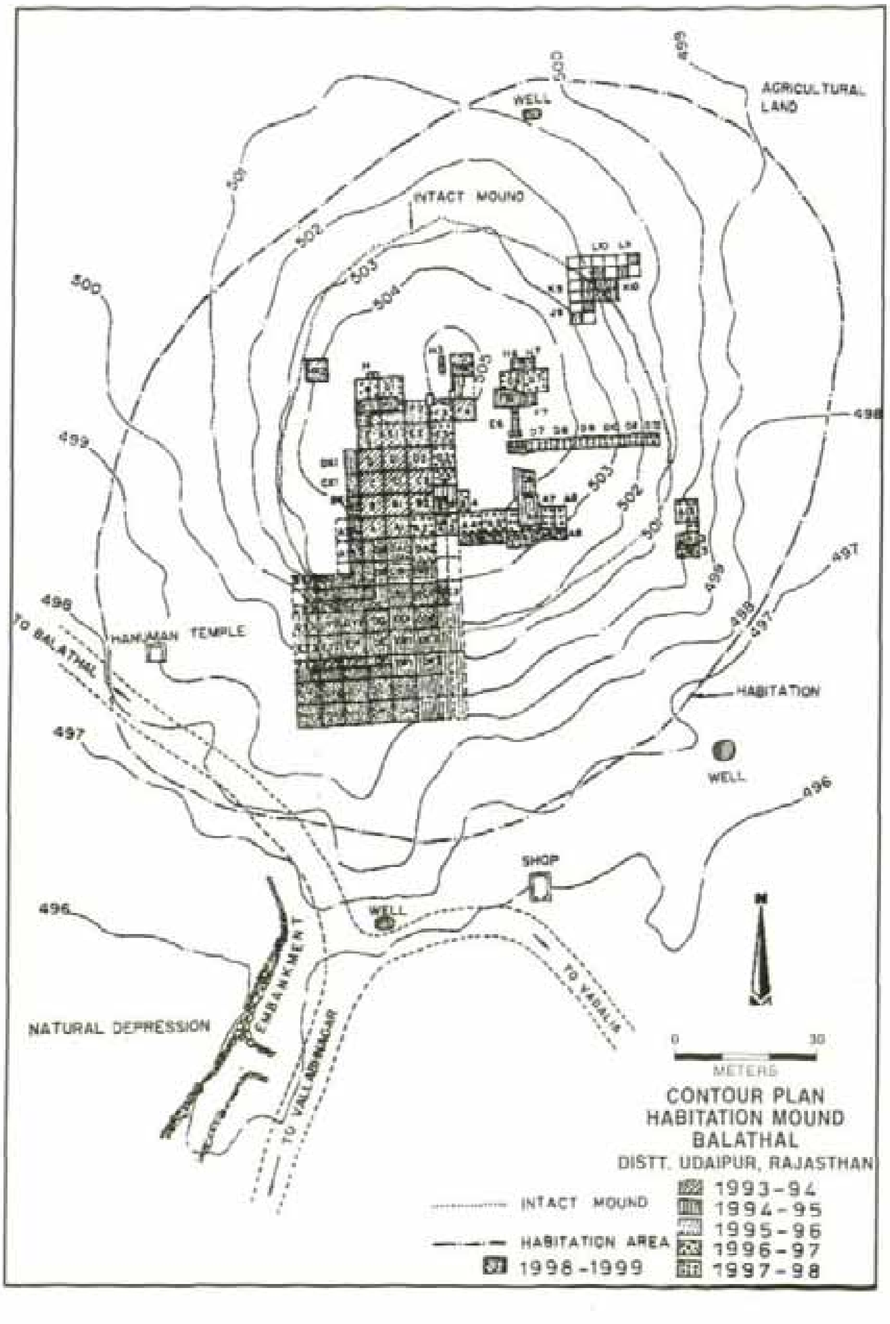
Institute., Pune and Lalit Pandey, and Jeewan Kharakwal of the Institute of Rajasthan Studies, Rajasthan Vidyapeeth, Udaipur. The excavators were assisted by Shreekant Jadhav, B.B. Dighe, D. Karanjkar, S.A. Pradhan, B.S. Gajul, Sunil Jadhav and Ravi Dhamapurkar, Balaram Tripathy, Niranjan Kulkarni and Anup Mishra along with M.D. Kajale, P.K. Thomas, P.P. Joglekar and Arti Deshpande who participated in the excavation for specialist studies. M.A. and M.Phil students of the Department of Archaeology, Deccan College and Diploma students of the Institute of Rajasthan Studies and B.A. Praveena Gullapalli, a research student of the University of Pennsylvania, USA, Neha Gupta, a graduate student of the University of Toronto, history students of St. Xavier's College, Mumbai and M.A. students of the Department of Ancient Indian History, Bombay University, also joined the team. The objectives of this year's excavation were to further uncover the plan and determine the function of the fortified enclosure, discovered and partially exposed in the central part of the mound during the previous seasons to trace the outer fortification wall further on the northern side of the settlement to trace the remaining portion of the Structural-Complex 1, represented by Structures 10A to 10K partially excavated in previous seasons; to excavate structural remains on the northern side of the mound to study social aspects of the Chalcolithic period; to study Chalcolithic cultural phase A for understanding the origin and development of the Chalcolithic phase at the site; to expose the remaining part of the iron working activities, discovered in the early historic levels and partially excavated in the first season (1993-94).

To achieve these objectives, 24 trenches, each measuring 5 X 5 m and covering a total area of 400 sq m were opened. Trenches E, El, E2, E6, F2, F3 and parts of F (SE), Fl (SE-SW), were excavated to uncover the plan of the fortified enclosure and determine its function. Trenches K10, K9 (NE-SW) L10 (SW) and LI 1 (NE-SW) were excavated to trace the Chalcolithic structures and extension of the outer fortification on the northern side of the mound. Trenches A2, B2, OA2 and OB2 (NE-NW) were excavated to trace the remaining portion of the Structural-Complex 1 represented by STR lOAto 10K. Trenches D3, E3, parts of C3 (northern half), OBI (NW) and OA1 (NW-SW) were opened to study the origin and development of the Chalcolithic phase at the site. Parts of Trenches BX1 (NE), CX1 (NE-SE) and DX1 (NE-SE) were excavated to trace the part of the early historic iron smelting activities (fig. 27).

The Chalcolithic period at Balathal is sub-divided into two phases, A and B, on the basis of stratigraphy, architecture and material culture. Cultural phase A can be dated on the basis of stratigraphy and a few radiocarbon dates to between c.2800 and 2400 BC. Four structural levels of this phase have been identified in the course of excavation this year. The first settlers lived in circular huts having well made floors and equipped with silos for storage. The subsequent three structural levels are represented by only floors belonging to possibly rectangular structures. No complete plan of a structure has been excavated so far of these three phases.

The Cultural phase A is characterized by coarse and hand-made plain and painted pottery, occasional presence of semiprecious stone beads, copper fragments, and total absence of stone blades. The coarse and hand-made ceramic of this phase

Fig. 27


AGRICULTURAL LAND
WELL
INTACT MOUND
HANUMAN TEMPLE
TO BALATHAL
HABITATION
WELL
SHOP
WELL
EMBANKMENT
NATURAL DEPRESSION
TO VALLABHNAGAR
TO VADALIA
METERS
CONTOUR PLAN
HABITATION MOUND
BALATHAL
DISTT. UDAIPUR, RAJASTHAN
INTACT MOUND
HABITATION AREA
1998-1999
1993-94
1994-95
1995-96
1996-97
1997-98

gradually develops into wheel-made and fine variety in the ascending order; and towards the end of the phase, it is transformed into mature Chalcolithic pottery.

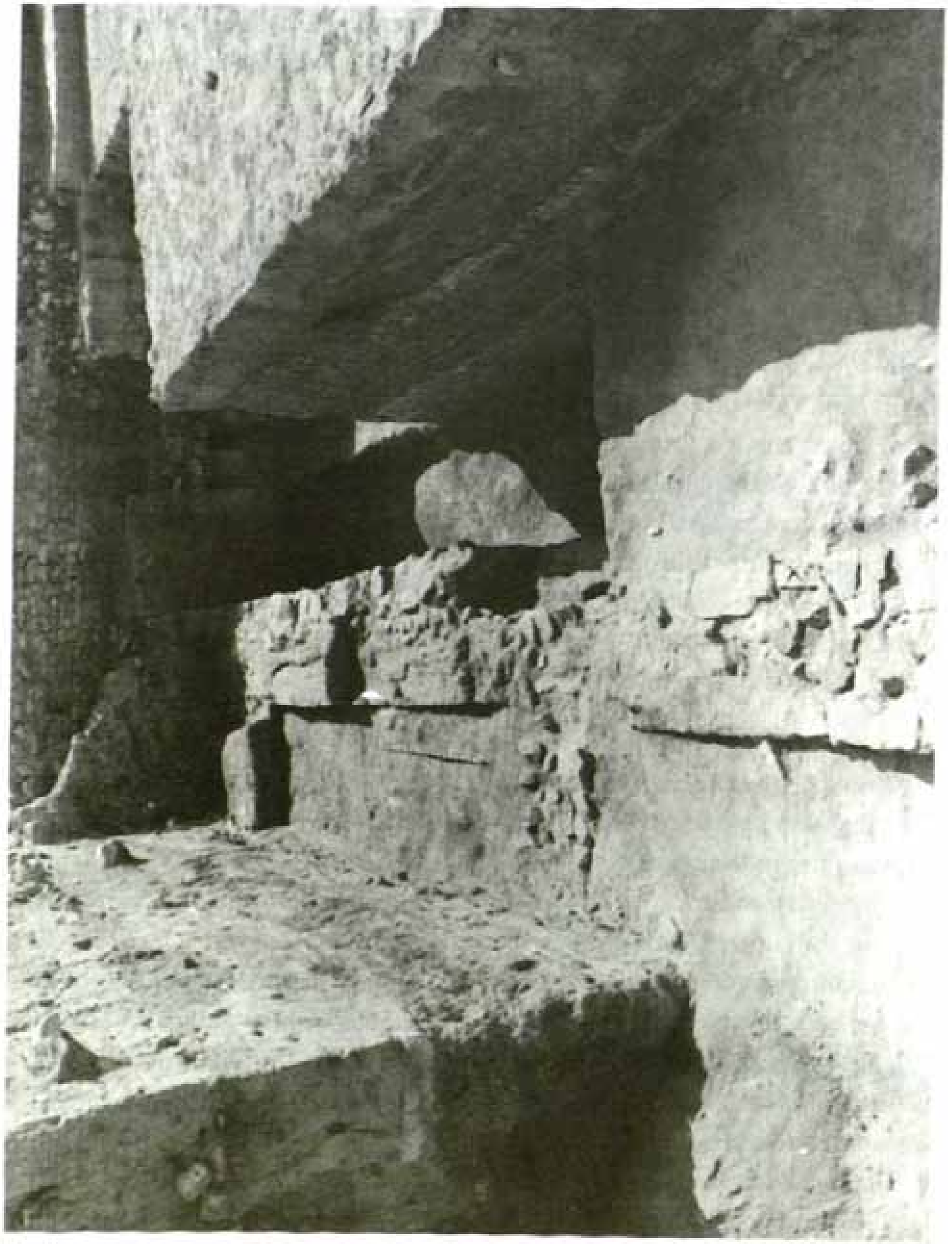
Cultural phase B (c.2400-1800 BC) marks a significant change in architectural activities at the site, hi the previous excavations, only four structural levels were identified in this cultural phase. However, this year's excavation produced evidence of four more structural phases below the (formerly identified) Structural phase I. The first four levels are represented by well made floors of brown silt and plastered with cow-dung. No complete plan of structures of the earlier four phases was excavated. However, from the remains it is clear that there was change from Cultural phase A to B in the use of construction material from mud and wattle-and-daub to mud-bricks and stones, hi the light of the discovery of a few Structural phases, the sequence of the earlier Structural phases has been changed. Formerly identified structural phase I changes to V, II to VI, III to VII and IV to VIII.

A plan of a massive rectangular multi-roomed structure (No. 32) belonging to Structural phase V was partially excavated in Trenches D3, E3 and F3. This structure underlies the northern wall of the fortified enclosure and is located almost in its centre. It consists of a north-south running wall which was traced from beneath the northern wall of the enclosure to a length of 11.55 m and an east-west running wall which emanates from the centre of the former was exposed for a length of 1.50 m. The foundation of the north-south running wall is made of flatfish stone, fourteen courses of which have been survived. Over this stone foundation stood a mud-brick wall. Its inner face was plastered with clay and cow-dung. The north-south running wall has a width of 95 cm and is survived to a height of 80 cm. The average width of the east-west running wall is 90 cm and only the basal course is survived. The exact nature of this structure cannot be determined as only a part of it has been exposed (pl. 58).

The entire plan of the fortified enclosure of Structural phase VI, partially exposed during the previous season, was made clear *(1997-98,* pp. 145-154), the excavation of a major portion of the inner part of the fortified enclosure revealed a thick deposit (average thickness 1.5 m) of burnt cow-dung on the top of a floor. This cow-dung appears to have been carefully deposited inside the structure as fuel after the structure was not in use for the purpose it was constructed. As far as the function of the fortified enclosure is concerned, this year's excavation has not produced sufficient clues. It is likely that this enclosed place may have provided protection to the inhabitants and animals at a time of crisis. In the southern wall of the enclosure was noticed an opening, which may have served as an entrance. This entrance is located 2.45 m to the west of the corner where the southern wall running east-west, turns to south at a perpendicular angle. The entrance was 6 m wide, and it was possibly closed later; it is represented by a vertical wall having a different nature of stones and construction method. The portion of the southern wall turning towards the south slopes considerably towards its southern end. It is quite likely that people climbed over this slope and entered the fortified enclosure.

The extension of the outer fortification (4 m wide) (Structural phase VI) was exposed on the northern side of the settlement for a length of 1.60

Plate 58



Balathal : rectangular structure inside the fortified enclosure, phase V, Chalcolithic

m. It was discovered in Trench L11, which is located almost on the periphery of the settlement. The outer fortification wall is similar in nature to the wall of the fortified enclosure. It is made of mixture of black and brown clay and is 2 m wide. It is supported on both the sides by stone wall of 1 m width.

A few mud-brick structures were excavated partially on the northern side of the mound. One of them (STR 31) located in Trenches J10, K9 and K10, is rectangular in shape. Parts of its eastern and northern walls have been exposed. The eastern wall, surviving to a height of 45, is exposed to a length of 5.40 m. It is made of mud-bricks of different sizes placed in header and stretcher pattern. The sizes of bricks are 40 X 20 X 10,26 X 10 X 7 and 37 X 20 X 16 cm. The northern wall, running in an east-west direction, is exposed to a length of 4.60 m. Its extant height is 45 cm. Both the walls are 90 cm broad.

One more mud brick structure was excavated in the northern half of Trenches J9 and J10. Only its eastern wall was excavated to a length of 7.10 m. In the south-west quadrant of J9 were found the remains of a rectangular house, which was completely burnt down. This structure had a stone foundation and mud-brick wall over it (pl. 59). It is exposed over an area of 2 m (north-south) and 1.40 m (east-west). Only a part of the eastern wall was excavated to a length of 2 m. It is 45 cm broad. Inside the structure were found four storage pots of grey and red wares and a small, circular bin, with a diameter of 65 cm and lined with clay. Some of the pots were filled with charred barley.

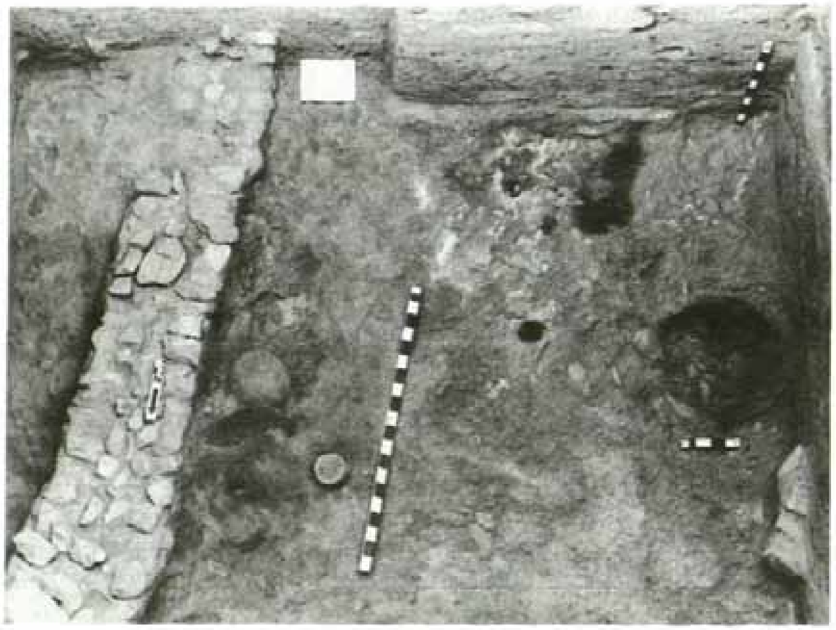
All these structures appear to be independent domestic dwellings as they contained circular fire places and sherds of coarser utilitarian wares. This suggests that the northern portion of the settlement was possibly occupied by the farmers whereas in the southern area were located large complexes with the evidence of craft manufacture.

One of the rooms (STR 101) of Structural Complex 1, excavated in the previous season, was completely excavated in Trenches OA2 and OB2. It is the largest room of the complex, measuring 9 x 7 m. The northern wall is 9 m long and the eastern wall running in a north-east and south-west direction, is 7 m long. Both of them are 60 cm broad and have survived to a height of 45 cm. Inside the structure near the western part of the northern wall was found a saddle quern. This room of the complex may have been used for carrying out domestic activities.

Even though the Chalcolithic phase is quite rich in material remains, the excavation this season yielded very few objects. They include the typical objects like beads of semiprecious stones, copper fragments and a variety of stone and terracotta objects. One of the noteworthy objects recovered this year is a large bone tool, made on a long antelope bone. The long bone is split vertically leaving the knot intact and then chiselled and polished to make a punch.

The early historic levels overlying the Chalcolithic deposit were also subjected to systematic excavation. The early historic occupation is confined to the top five layers, including the black sterile layer (5/13) overlain by the uniform white layer of ash (4). A number of burnt wattle-and-daub, rectangular and squarish structures were exposed on the southern and western parts of the mound. However, none of the

Plates 59-60



59



60

Balathal : 59, burnt rectangular structure and 60, iron sickles, early historic

structures could be exposed in its entirety. One of the rectangular structures (No. 29) excavated over an area of 2.10 sq m in north-east quadrant of OB2, contained a circular pit filled with charred rice and a circular fire-place. The other structure (No. 30), partially excavated in the eastern half of Trenches BX1, CXI and DX1, had well made three successive floors, suggesting that it was under occupation considerably for a long period. On the last floor of this structure near the southern end were found large burnt pieces of clay and fragments of iron slag. The evidence suggests that in a part of this structure iron working activities were carried out.

Besides a couple of small, circular tablets bearing Brahmi letter *ma,* characteristic of the beginning of the Christian era, were found besides a large number of iron objects like sickles (pi.60), fragments of hoes, arrow-heads and small scrapers.

TAMIL NADU

55. Excavation at Attrambakkam, Tiruvallur Taluk, District Chengai-Anna

Excavation was conducted at the site of Attrambakkam under Shanti Pappu, N.C. Ghosh, assisted by Rhea Mitra. The site of Attrambakkam (13° 13' 50" N and 79° 53' 20" E; 55 m AMSL) is located on the north bank of the Attrambakkam odai (gully), at a distance of 4 km to the west of the River Kortallayar, northern Tamil Nadu (Toposheet 57 O/ 16,4 km west of Poondi, Tiruvallur taluk). The area is dissected by the Attrambakkam odai (Budida Manu Venka); a stream of the second order which rises 2 km upstream at the tank at Aryathur. Numerous rain rills dissect the site and gullies and artefacts are exposed eroding out over an area of around 50,000 sq m.

The present excavation was extremely rewarding owing to the following factors.

Excavation clearly confirmed the existence of Acheulian and Middle Palaeolithic artefacts in a sedimentary context of clay beds, which was only hinted at by previous scholars and which may represent a swamp/palaeo-pond.

It was clearly established that the laterite/ ferricrete and gravel is not the horizon for Palaeolithic tools, as was previously thought.

The excavation established a clear evidence of development from Acheulian to Middle Palaeolithic, with the existence of microliths on the surface.

The presence of an Early Acheulian phase with large crude handaxes and flakes, is a strong possibility brought out by this excavation.

For the first time, the clear erosion of deposits and tools from certain parts of the site could be established and thus explained the differences in stratigraphy of previous workers.

In Tamil Nadu, a fossil of a bovid tooth was found for the first time in association with Acheulian artefacts. Similary, for the first time, foraminifera was identified in the clay samples.

This excavation for the first time brought to notice hitherto unknown aspects of the site's stratigraphy, cultures and depositional history. The site is one amongst the numerous Palaeolithic sites of the Kortallayar basin, Tamil Nadu and has been investigated for more than a century.

The site was discovered by Robert Bruce Foote and William King of the Geological Survey in 1863.

For a brief study, sixteen 1 X 1 m grids were sampled (fig. 28). No trenches could be taken and gully sections were studied. This stratigraphy is erroneous and points to the danger of studying only gully sections in this region. Sections along the gullies are a result of slope movements and thus it is now realized that conclusions drawn from here are not indicative of the true artefact horizons. What is important to note here is the complete absence of tools in the underlying beds of shaly-clay in the gully sections. This has led to the conclusions drawn by most previous workers that the ferricretes/laterites are the tool-bearing horizons and that the shales/clays are archaeologically sterile.

The stratigraphic sequence noted in the gully cuttings to the north of the site is as under (fig. 29).

The bed-rock comprises the Avadi series of marine shales of Lower Cretaceous age. An impression of Ptyllophyllum was found here.

Ferricreter rests disconformably on the shales and has a thickness ranging from 30 cm to 1 m in different parts of the site. It is totally absent 50 m downstream where the yellowish clay with *kankar,* 1 m thick, rests directly on the shales. Variation is noted within the sections based on the presence or absence of a pebble bed, which dips to the south-east in the northeastern part of the site and to the south-west in the northeastern part. This is noted in Section 1 at a depth of 85 cm below the surface and had a thickness of 11 cm. No distinct orientation or imbrication could be noted here. In Section 2, two distinct pebble lenses were noted at a depth of 80 cm below the surface separated by 40 cm of ferricrete and with thickness of 25 cm dipping up towards the south-east. Both pebble lenses appear to coalesce and from one pebble bed noted in Section 1 at a lower elevation. In Section 3, a pebble lense was noted dipping south-west approximately 20 cm in thickness and at a depth of 60 cm below the surface. This is also observed in Section 4, where the ferricretes are at a depth of 2 m below the surface with a pebble lense dipping south-west. The eastern part of the site has witnessed reworking of the shales, which in Section 4, cap the ferricretes. In Section 5, four red bands were observed approximately 2 cm thick and separated by 5 cm of ferricrete along with possible rhizoliths.

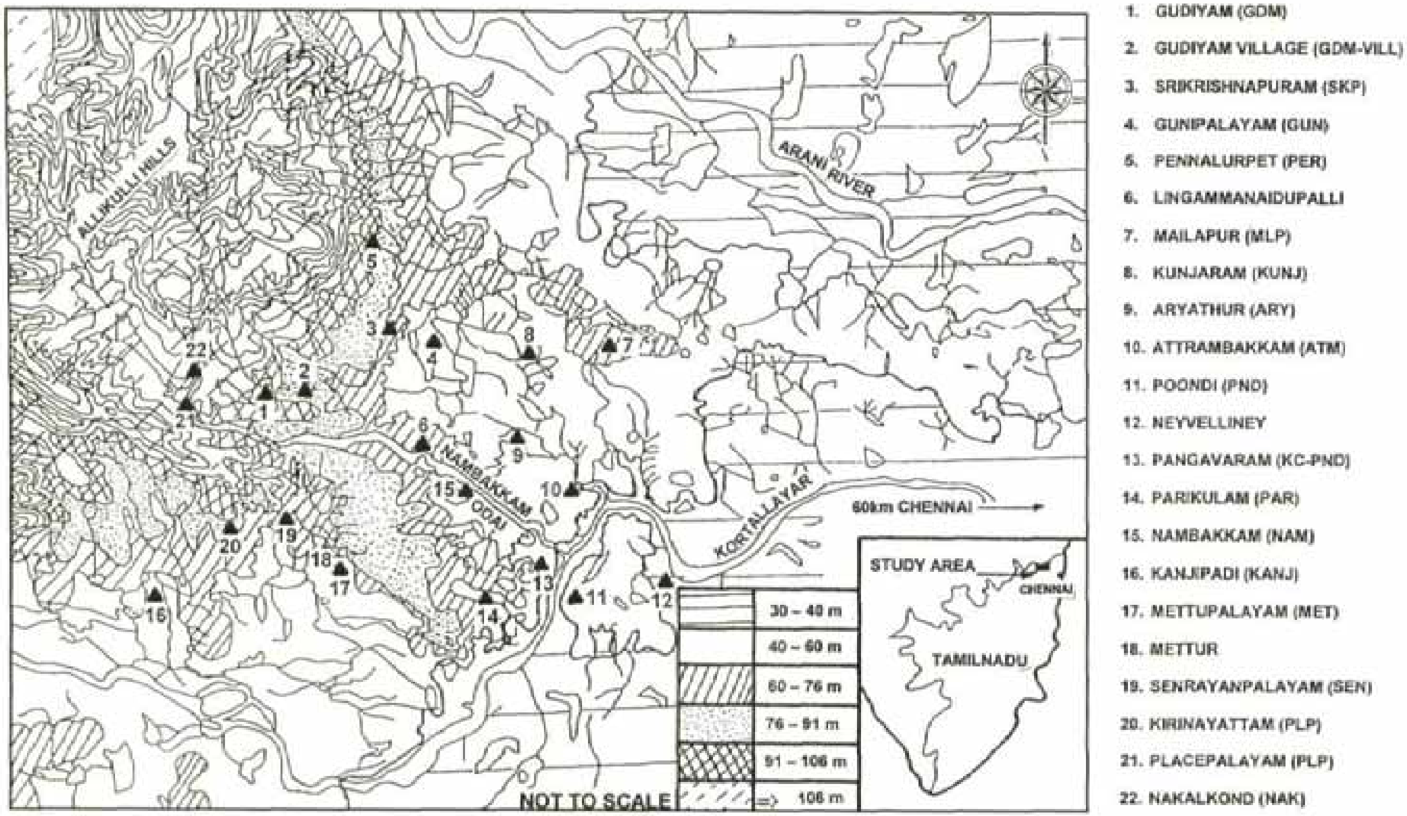
An examination of the sediments under a hand microscope revealed that the ferricrete nodules above 8 cm in size are angular while those in the 4 cm and in the 2 cm range are largely rolled. Angular quartzite and sandstone chips were also noted. In 1 cm size range, quartz was also noted.

Clayey-silt and calcrete (10YR 6/8) overlies the ferricretes disconformably and contains calcrete and iron infiltration from the overlying calcrete horizon and ferricrete lag. The calcrete forms a thin lag overlying this surface with which it appears to be intimately associated. The clayey-silts have a thickness of 50 cm. Ferruginous nodules observed are angular and in general fall within the size range of 4 cm to 2 cm size. However, some of the nodules falling in the size range of 2 cm appear to be rolled. Some calcium carbonate nodules are also seen.

This is capped by Ferricrete lag and Holocene alluvium (3-6 m thick) which rests directly on the shales at the village of Krishnaveram, at a distance of 20-30 m from the site.

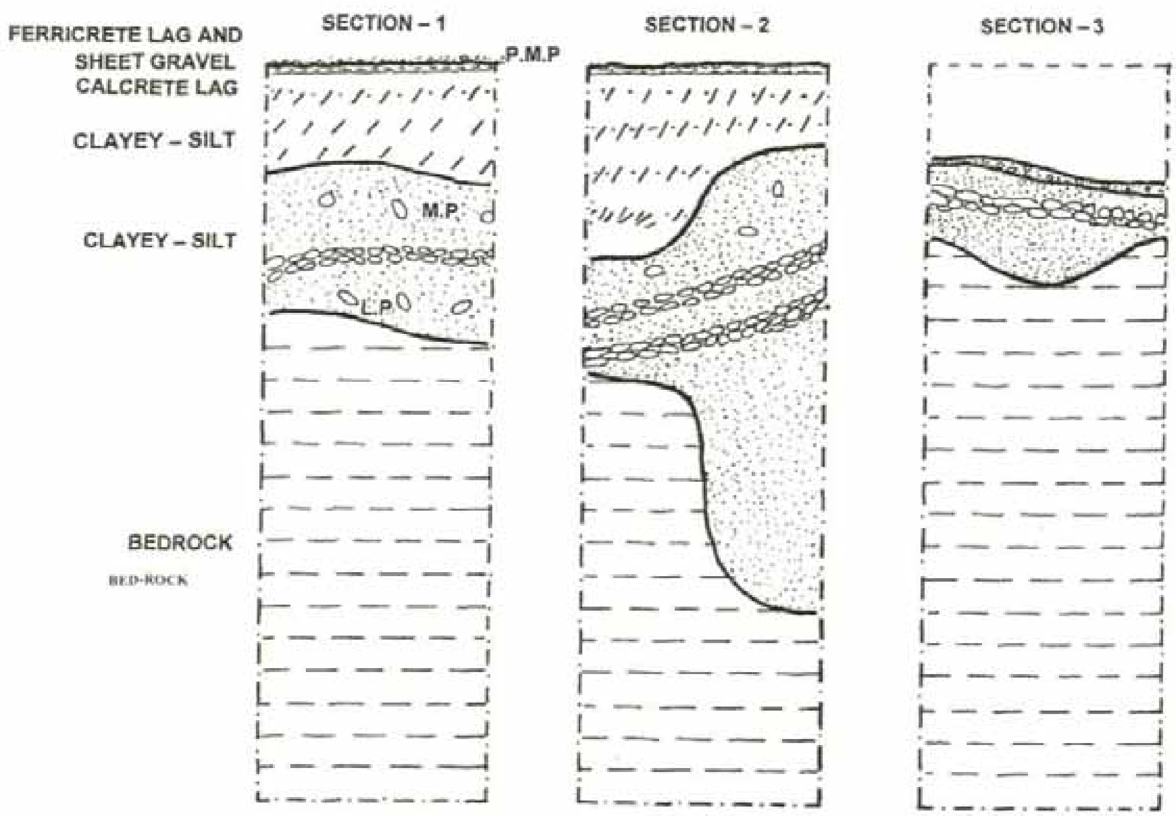
At a distance of 100 m downstream, three point bar deposits were noted along the odai. Scatter 1 (25 X 10m) consists of quartzite and quartzite sandstone pebbles and cobbles. Towards Aryathur, one more scatter was noted. Scatter 3, located on the west bank of the stream (20 X 30m) consisted of cobbles

Fig. 28



The region and drainage map showing Palaeolithic sties

Fig. 29



L.P ACHEULIAN ARTEFACTS

M.P MIDDLE PALAEOLITHIC ARTEFACTS

P.M.P POST – MIDDLE PALAEOLITHIC ARTEFACTS

with an average length of 10-12 cm along with calcrete *(kankar)* nodules. In all scatters, tools were noted. Ferricretes were not noted anywhere else in this locality. Most sections displayed shales capped by 1 m of sandy soil. Near Krishnaveram, recent alluvium of the Kortallayar either rested directly on the shales or on ferricretes and extended upto 3-6 m in thickness.

Chemical analysis points to relatively immature ferricretes. The Fe_2O_3 values in layer 2(116 cm) stand out in contrast. This horizon is associated with a pebble bed possibly pointing to fluvial action. Most prominent here is the dip of the pebble beds.

As the work of R.B. Foote, V.D. Krishnaswami and K.D. Banerjee and the author's own brief survey differed with respect to several vital factors as regards the context of tools and stratigraphy, it was deemed essential to excavate the site in a systematic phased manner. This excavation hopes to solve the following issues:

a. Determination of the stratigraphy of the site

b. Determination of cultural horizons

c. Determination of the geomorphology of the site

d. Study ofpalaeo-environmental conditions during the Quaternary at this site (pollen, phytoliths, micro-organism, faunal remains, etc.)

e. Study of stone tool technology of the Lower and Middle Palaeolithic and determination ofhominid activities at this site

f. Dating of tool-bearing horizons using palaeo-magnetic dating methods and dating of associated organic remains/fossil using U/Th, ESR, radiocarbon dating methods

Based on reports of K.D. Banerjee's trenches, it was felt that this was one of the few sites in this region, which was in a relatively primary context that could throw more light on the Middle and Lower Palaeolithic cultures in Peninsular India.

In order to determine the distribution of tools and stratigraphic variation across the site, test trenches (2 X 2 m) were sunk at different parts of the site. These were divided into four quadrants each and numbered alphanumerically (A 1, A2, B1, B2). All measurements of artefacts, pebbles, cobbles, etc., were recorded. Each dig was not more than 3 to 5 cm. Artefact and clast position, depth and in most cases, orientation/inclination and imbrication were recorded. All artefacts/clasts were washed and numbered at the site.

This season's work began with the sinking of five index trenches: Tl, T2, T3, T4 and T5 which were dug on the northern, southern, eastern and western parts of the site in order to ascertain the stratigraphic sequence and cultural horizons.

The main index Trench was T3 (2 X 2m) dug to a depth of 7.30 m and T5 (2 X 2m) to a depth of 3.45 m. Each trench was divided into four quadrants of 1 m each, which were labelled in alphanumeric order *viz.,* Al, A2, Bl, B2. Recording of artefact location was limited to their position within each quadrant. The depth of each artefact and natural clast was however, recorded. All sediments were passed through a 2 cm sieve and micro-artefacts were collected and bagged. The clay deposits were also subjected to wet sieving and crushing to miss any artefact, which may have been missed while sieving.

In one quadrant of T5, the ferricrete horizon, was dug at 3 cm intervals, and the orientation and

inclination of each natural clast and tool present was taken to obtain a preliminary idea of any possible fluvial action.

Trench T4 (1 X lm) was a test pit taken along the border of the northern gully. This was dug at 3 cm intervals and all artefacts/clasts were plotted, with specific attention paid to the orientation, inclination and imbrication of tools and natural clasts. Sediments were subjected to sieving through a 2 mm sieve. The purpose of this trench, located at a lower elevation from T3 and T5, was to determine the nature of slope wash and erosion at the site. Trenches Tl and T2 were discontinued for the present.

Provisional Lithostratigraphy (as noted in Trench T3):

1. Top soil with microliths
2. Sandy-clay with concentration of calcrete nodules: 0 to 1.15 m-archaeologically sterile
3. Nodular-clay with ferricrete pisoliths, black manganese nodules and iron pisolith: 1.15 to 1.80 m - a few Middle Palaeolithic tools
4. Calcareous sandy-clay: 1.80 to 2.40 m-sterile - unconformity
5. Ferricrete stone line: 2.40 to 3.00 m-a few Late Middle Palaeolithic tools - unconformity
6. Laminated clay (possibly Avadi shales?): 3.00 to 7.30 m-Early to Late Acheulian and Middle Palaeolithic
7. Avadi Shale (Lower cretaceous)

While the artefact and soil samples are still to be studied in detail, the site threw up several problems which need to be resolved, before it can be considered suitable for throwing light on Acheulian cultural patterns.

Acheulian artefacts occur in the laminated clay bed from a depth of 4.5 to 7 m below the surface. At a depth of around 6.50 m and below, large crude flakes were noted along with crude handaxes, which appear to represent a possible Early Acheulian phase. Supporting this possibility is the discovery, some years ago, of a large crude 'handaxe' in the gully bed. A number of handaxes were found in addition to large flakes, scrapers, and debitage.

The Acheulian horizon grades imperceptible into the Middle Palaeolithic, which are also noted in the laminated clays. Tools are very fresh and include scrapers, flakes, handaxes and debitage. A few cores were also noted.

Late Middle Palaeolithic and post-Middle Palaeolithic tools are noted in the ferricrete gravel disconformably overlying the clays. They are a mixed assemblage of tools, some including microliths, blades, miniature handaxes and flakes. They are both rolled and fresh and appear to have been reworked from lower horizons or redeposited from adjoining area occurring at a higher elevation. Some are patinated with iron encrustations.

Conjoinable tools are an important finds, three parts of a modified pebble which were found in T3 and fitted together. This is a strong proof for the primary nature of this site.

Preliminary analysis of sediments points to the influence of sheet and stream floods at the site. The laminated clay beds containing Acheulian and Lower Palaeolithic tools may point to the existence of swamps/ponds in a flood plain environment. Further studies, including that of clay mineralogy are in progress and will help in determining the relationship between the clays and the underlying shales.

The careful sieving the sediments revealed one fossil tooth (2 cm in length) associated with Acheulian artefacts at a depth of 5.90 m in T5. This has been identified as being of the *bovidsp*. Further studies are in progress. The fossil is important as it is the first fossil discovered in an excavated context from a Palaeolithic site in Tamil Nadu.

Studies on Micro-organisms by the Department of Geology, University of Madras, have revealed the presence of numerous siliceous foraminifera in the laminated clay beds. This is important as it revealed the possible marine influence on the origin of these sediments.

Artefact analysis is in progress which includes a study of artefact morphology and technology. Soil samples have been sent for analysis. The fossil is being analyzed and will be subjected to U/Th dating.

The excavation revealed a very high density of tools, which are fresh and exhibit a cultural sequence from the Acheulian to Mesolithic. The site appears to be relatively undisturbed and suitable for large-scale long term horizontal excavations.

56. EXCAVATION AT MAMALLAPURAM, DISTRICT KANCHIPURAM

In continuation of the last season's work *(1997-98,* pp. 156-159), the Chennai Circle of the Survey, under the direction of K.T. Narasimhan, assisted by Sathyabhama Badhreenath, G. Thirumoorthy, K.P. Mohandas, R. Jayaraj, R. Vinayagam carried out excavation in the Shore Temple- complex area. The team also undertook the simultaneous conservation of the excavated structures. The area close to the last season's work around the modern well and the area near the stepped structure on the northern side were exposed.

Few trenches laid further north and west of the modern well revealed two brick walls (length 8.40 m) running almost parallel in north-south orientation at a depth of 1.10 m. The outer wall (west) is with a depth of 1 m, width of 0.85 m and eighteen courses of bricks, built over a cushion of stone-slab which is incidentally suitable to the environmental conditions of the area. To the east of this wall after a gap of 1 m is the second brick wall (inner) built on the stone flooring and parallel to the earlier brick wall. There are thirteen courses of bricks with a height of 0.75 m and width of 1.15 m. At the northern end of this wall is found a chamber ofbrick walls with a stone flooring. This might have served as a store room (?). The walls were raised in uniform square pattern over a specific height, an interval of gap filled with pure clay was provided horizontally and vertically. The binding media was only earthern mortar. At the bottom of the brick structure was provided with stone-slabs. The exposed structure here may be assigned to early medieval period.

Further, to ascertain the extent of the already exposed stepped structure on the southern side of the Shore Temple-complex, the excavation was conducted to the north of the Shore Temple where a continuous flight of steps (five) were exposed. Landing towards east, it is similar to the one on the south. It was traced to a distance of 25 m towards north. The style of construction of steps here are akin to the method adopted by the megalithic people in building their tombs. The constructional method adopted for locking the veneering stones from possible internal collapse is a significant aspect of this structure. A 0.30 m wide stone-slab with rounded top-edge and groove just below the rounded top pirmely embedded in the laterite core, is placed at almost the centre of the vertical joint of the two slabs fitting into the groove.

In addition, another smaller slab with groove is projected from the core to hold the slabs at horizontal joint of the veneering slabs. Thus, the veneering slabs are well secured from internal collapse by the method of dry masonry popularly known in this region during the megalithic period.

Almost at the middle of the stepped area towards northern side was unearthed a brick structure-like platform, turned towards east from its original portion (second step) and fallen to the east in four large chunks, supporting wall or pillar was found below these chunks. However, a wall (small portion) with five courses of bricks built over the granite slab was unearthed parallel to the said structure on eastern side.

This structure was constructed over the steps with the second step acting as a support for the western part of the platform. The original vertical slab of the second step is still affixed with the exposed brick structure is a clear evidence, that the structure in question was built over the step on east-west orientation. The structure is cemented by pure thick-lime mortar. If all the fallen chunk pieces are joined, it may form a rectangular structure possibly with an approximate dimension of 10 x 5 m. Here, the size of the brick, i.e., 32 x 18 x 6 cm indicates that this structure might have been built during the dawn of history, as stated in early Tamil literature, since Mamallapuram has been a well known port city right from the beginning of the Christian era. It could be inferred that this structure may possibly be a part of jetty point (?) extending towards the east and may have served as a landing point for small boats through a small inlet (back water) from the sea. Only further probing will give a clear picture on the above findings.

To the north of the fallen brick structure, at a depth of 2.90 m from the surface, was found granite stone-slabs in east-west orientation with five courses of bricks over it. To further north a laterite wall running in east-west orientation and a similar wall in north-south orientation was traced, and in fact this later wall starts from the edge of the previous wall on the eastern end. The wall might have acted as a breaker against the waves.

The ceramic assemblage includes large storage-jar of coarse sturdy red ware, dish, bowl, pot of red ware etc. Also traced were a few pieces of conical jar possibly an imitation of amphorae jar of Roman type prepared locally which is of early historic period.

Among the antiquities, the most interesting find comprises a human stucco figure (?) (broken) collected from the stepped area.

Conservation work was taken up simultaneously for preventing the structure from collapse. The brick structure was pointed (sunken pointing) by lime-mortar prepared by hand grinding mixed with galnut, and jaggery. Red oxide powder was added to match the colour. The fallen brick structure was reconstructed as per the original with available old bricks. The stone structure was consolidated using lime-mortar.

57. Exploration in District Pudukkottai

P.S. Sriraman of Chennai Circle of the Survey, noticed the following cultural remains under village-to- village survey in Kulattur taluk.

Village/Site	*Nature of remains*
Avur	Church datable to nineteenth century Temple
Kilakkurichchi	datable to thirteenth-fourteenth century Inscribed
Kiliyur	slab Megalithic burial site
Laknapatti	Loose sculptures of Ayyanar with his consort, *matrika,*
Melapuduvayal	Ganesa datable to Chola period
	A Siva temple with loose sculptures, assignable to late Chola period
Nanjur	Remains of a temple with loose sculptures of Vishnu,
Odukkur	Subrahmanya and Brahma of late Pallava period
	Ruins of temple with inscriptions, loose sculptures
Perambur	datable to tenth-thirteenth century
	Ruins of a temple with inscription of thirteenth-fourteenth century
Simanur	Temple datable to tenth century
Suriyur	Loose sculptures of Ganesa, Chandikesvara, Surya,
Valamangalam	inscribed slab of Chola period

58. EXCAVATION AT TIRUVERKADU, DISTRICT TIRUVELLORE

The Department of Ancient History and Archaeology, University ofMadras, Chennai, continued its excavation at Tiruverkadu in Sriperumbudur taluk, under the direction of S. Gurumurthy, assisted by R. Ponnusamy, M. Seran, and P.D. Balaji.

The Trench TVD5 measuring 6 x 5 m was laid to the east of the Ayyappa Samigal Mutt and to the west of TVD4. During the course of excavation, cultural deposits to a thickness of 2.27 m was traced, below which appeared the natural soil. Seven layers with some minor disturbance were identified.

The deposits have been tentatively assigned to three cultural periods, ranging from 400 BC to the late medieval period. Period I has two sub-divisions namely IA and IB; the first period representing the Iron Age phase (400 BC to AD 200) and the later, the post-Iron Age phase (AD 200 to 600). Period II represents the early medieval period (AD 600 to 1200) and Period III is assignable to the late medieval period (AD 1200 and after).

In Period IA black-and-red ware, and black ware sherds were collected. A floor level with a thickness of 5 cm was identified at a depth of 1.36 m BS. It was laid with broken pieces of potsherds, brickbats and mixed with clay and lime. The pottery at this level included black-and-red ware, black ware and lids. A rubbing stone and a few domestic

materials were also collected. Iron slags collected here could suggest the functioning of iron smelting industry.

Two terracotta human figurines belonging to the Period IB are interesting. The first one (96 m BS) is a mould-made female figurine in seated posture (ht. 10 cm) with upraised hands, the right holding an indistinct object (?) and the left is broken. The second one is a solid, female figurine (ht.6 cm) found at a depth of 80 m BS. It is also with upraised hands, of which the right is holding an indistinct object (?) while the left is broken. The portions below the navel and the head are broken. These figurines could have been used as cult objects in rituals.

In Period II, red-slipped ware and coarse red ware were the predominant pottery noticed. Here, an assemblage of broken pottery (42 m BS) was noticed. In the same level large-size bricks and tiles were found. A few pieces of charred bones were also collected. The Period III was characterized by the presence of coarse red ware only. Compared to the early levels, small quantity of cultural materials were collected.

59. Exploration in District Vellore

K.P. Mohandas of the Chennai Circle of the Survey, noticed the following cultural remains under village-to-village survey scheme in Arakkomam taluk.

Village/Site	*Nature of remains*
Avalur	Ruined Siva Temple of late Chola period
Ayappadi	Loose stone sculptures of Ganesa, Karttikeya, Vishnu, Devi and *linga* of late Chola period
Dharmanidhi	Loose stone sculpture of a male figure in *anjali-mudra* standing in *samabhanga*
Iralachcheri	Loose stone sculpture of a Tirthankara datable to tenth-eleventh century
Kalattur	Siva temple with inscriptions of late Chola period
Karivedu	Siva temple with inscriptions and a Vishnu temple of Vijayanagara period
Kattalai	Vishnu temple of late Chola period
Kondapuram	*Mandapa* of Vijayanagara period
Maganipattu	Siva temple and a Vishnu temple of late Chola period
Mamandur	Siva temple and a Vishnu temple of late Chola period
Nangamangalam	Vishnu temple of late Chola period
Ocheri	Siva temple and a *mandapa;* loose sculptures of Vishnu, Sridevi and Bhudevi datable to Vijayanagara period; loose sculpture of Tirthankara, datable to tenth-eleventh century
Sen	Vishnu Temple of late Chola period

60. EXPLORATION IN DISTRICT VELLORE

The Pre-history Branch of Tamil Nadu State Department of Archaeology explored the sites at Pallikuppam Forest beat near Servairayanpatti of Gudiyattam taluk, Vellore district and noticed some megalithic monuments *viz.,* cist burials. During the exploration megalithic appendages which include a three-legged jar and a conical jar were collected from the exposed burials.

The cist burials noticed here are found to have been constructed with four granitic orthostat slabs in the form of *svastika* with huge caps placed over it. However, one of the cist burials is seen partially exposed to the ground with a port-hole in the eastern side slab more or less resembling 'U' shape.

This exploration was carried out by S. Vasanthi and Srikumar, under the guidance of A. Abdul Majeed, Director of Archaeology (I/C), Government of Tamil Nadu.

61. EXPLORATION IN DISTRICT VILLUPURAM

M. Nambirajan of the Chennai Circle of the Survey, noticed the following cultural remains under village-to-village survey in Gingee taluk.

Village/Site	*Nature of remains*
Anattur	Ruins of a temple probably of late Chola period and loose sculptures
Kadambur	Loose sculptures and Tamil inscriptions of Chola period and ruins of a temple, probably of late Chola period
Nangjlikondan	A dilapidated temple probably belonging to late Chola period
Sewilagam	Loose sculptures of Ganesa and Nandi
Vadavanur	A dilapidated temple probably belonging to late Chola period and loose sculptures

TRIPURA

62. EXCAVATION AT SHYAM SUNDAR TILLA, PASCHIM PILAK, DISTRICT SOUTH TIRPURA

K. Lourdusamy, assisted by Jitumani Das of the Guwahati Circle of the Survey, carried out scientific clearance work at the site with a view to ascertaining the nature and extent of the structure partially exposed earliar(*1984-85,* pp. 78-79).

The work undertaken towards south of the south-west corner of the mound exposed a part of a 1.00 m high and 1.30 m wide structure built of burnt-brick set in mud-mortar. Different sizes and shapes of bricks are used in construction such as square, rectangular, triangular, etc. measuring 20 cm X 25 cm X 5.5 cm, 29 cm X 18 cm X 4.5 cm and 20 cm X 30 cm X 5.5 cm. The triangular bricks are of 17 cm X 17 cm x 30 cm X 4.5 cm, 22 cm X 20/4 X 27 cm X 4 cm and 23 cm X 12 cm X 25/2 cm X 4.5 cm. Some of the bricks are decorated with geometrical and floral designs. The exposed structure appears to be the remains of a temple with *mukha-mandapa, arddha-mandapa* and a *garbhagriha* on plan *xvithpradakshinapatha. Garbhagriha* could not be exposed in this season's work. On stylistic ground the temple may be datable to ninth-tenth century AD.

Plates 61-62



61



62

Shyam Sundar Tilla : 61-62, *terracotta plaques showing flying human figures and animal figures*

From the debris accumulated in and around the outer wall of *adhishthana* portion, was removed and found a series of twenty-nine moulded terracotta plaques located *in situ* while thirty-five were noticed in the debris. They are decorated with the motifs comprising human, animal (pls. 61-62), birds and mythological figures. Human beings are shown as warriors holding bow and arrow, sword etc. Among the other motifs, the votive stupa and seated Buddha, are noteworthy. These terracotta plaques on stylistic ground are comparable to those found at Paharpur, Mainamati, and Vikramasila.

63. EXCAVATION AT THAKURANI TILLA, PASCHIM PILAK, DISTRICT SOUTH TRIPURA

K. Lourdusamy, assisted by Jitumani Das of the Guwahati Circle of the Survey, carried out excavation at the site with the main objective to ascertain the nature of the buried structures by first selecting the northern part of the mound for the purpose.

Excavation exposed the remains of 5 m square *garbhagriha* having a height of 50 cm and extant course of bricks set in mud-mortar. Another square structure measuring 10.50 m was found parallel to and encircling the aforementioned structure. Southern side wall of this outer structure was left unexposed due to the presence of a thick banyan tree.

The presence of a quartz *Siva-linga* fixed in a sandstone *yonipitha* in the north-east corner, and at the centre of the sanctum, circular sandstone *pitha* (1.50 m in circumference) with square socket and a miniature votive *lingam* made of crystal are suggestive of the temple affiliation to Lord Siva. The ceramic assemblage includes a few featurless potsherds of dull red ware only.

On stylistic ground the temple (pl. 63) can be datable to *circa* ninth-tenth century AD. This small temple may be taken to be the other subsidiary shrine and taken together with the earlier exposed Surya shrine associated with the main shrine larger in size and still lying burned in the centre of the mound.

UTTAR PRADESH

64. EXCAVATION AT JHUSI, DISTRICT ALLAHABAD

The excavation at the site of Jhusi, District Allahabad, were resumed in this session also. As in the preceding years the Samudrakup mound was chosen for excavation. In this connection, it may be pointed out that during the last season *(1997-98,* pp. 164-170), the excavation at the site revealed a cultural sequence from pre-NBPW period to the Gupta period, divisible into: pre-NBPW, NBPW, Sunga-Kushan and Gupta. Further, the excavation also revealed that after the Gupta period there was a cultural gap at the excavated areas. However, in the medieval period the site was reoccupied. The cultural deposit at the site measures about 15 m. This represented a vertical record of the cultural span of the site. However, as the NBPW and pre-NBPW deposits at the site measured 3.36 and 2.81 m respectively, the excavators were tempted to concentrate on these two cultures, i.e., pre-NBPW and NBPW. With a view to understanding the profile of the cultures during these periods, this season's excavation was initiated at the site.

The excavation was conducted by J.N. Pal and M.C. Gupta, under the general supervision of V.D. Misra along with the assistance of Anil Kumar Dubey and Ram Naresh Pal, Rajendra Prasad, V.K. Khatri and Kamlesh Kumar, Arvind Malviya, Sharad Suman and Sanjay Kumar of Allahabad Museum.

As indicated earlier, the excavation was initiated this year with a view to exposing the remnants of

Plate 63



Thakurani Tila : general view of excavation

Plate 64



Jhusi : general view of excavation

earlier cultures, pre-NBPW and NBPW. With this end in view two Trenches B-15 and A-15 were laid out on the eastern margin of the Samudrakup mound (pl.64). Trench C-15 also measuring 5 sq m was partly excavated during the last season. As this trench was not exposed upto the natural soil it was also taken up for further excavation.

Layers (45 to 63) characterized the pre-NBPW horizon at the site. This total deposit measuring 4.36 m in thickness was further sub-divisible into two groups A and B on the basis of occurrence or non-occurrence of iron objects.

A deposit measuring 1.9 m constitutes the pre iron horizon of the pre-NBPW phase (Sub-phase A). This deposit comprised eleven layers from 53 to 63. The upper horizon of this cultural deposit is ashy in character while the lower ones comprising layers 59 to 63 are characterized by compact yellowish clay. The pre-iron deposit at the site yielded ceramic assemblage characterized by slipped ware, black-and-red ware and red ware, the last one further sub-divisible into a number of sub-groups on the basis of colour, surface treatment, firing besides paintings and incised decoration (pl. 65). Among the functional types mention may be made of different types of bowls and dishes, basins, storage-jars, etc. The occurrence of pedestalled bowls in good number from this horizon may also be mentioned in this connection. There were no substantial difference between the ceramic assemblage of this sub-cultural phase and that of the overlying phase. But the pottery of this group appeared a bit crude in comparison to ceramic assemblage of the overlying deposit. Though the pottery is mainly wheel-thrown, the hand-made specimens are also occasionally met with. Pottery from this horizon compares well with its counter parts in the Vindhyas on the one hand and those of the Chalcolithic sites of the Ganga valley on the other. Comparable shapes also have been found in PGW and black-and-red ware assemblage of the upper Ganga valley as well. A number of bone objects including arrow-heads have been found from this horizon. In this connection particular mention may be made of barbed and socketed arrow-heads with engraved circlets. This type is supposed to be characteristic type of the Chalcolithic sites of the middle and lower Ganga valley. Occurrence of such types has been reported from Narhan, Chirand, Senuwar, etc., on one hand and from Koldihwa in the Vindhyas on the other. Beads fashioned on semiprecious stones and terracotta have been found. From the hearths associated with this phase sizable number of animal bones have been obtained. The identifiable species include cattle, sheep, goat and pig. Bones of aquatic creatures like turtle and fish were also found. The pits occasionally yielded remains of wheat, barley, rice, *moong,* etc. Occasionally flakes and flake fragments of chert and chalcedony were also found from this horizon. A beautiful triangle and some retouched blade fragments were other noteworty finds. Though distinct and separate cultural horizon of these lithic components could not be demarcated, the occurrence of these pieces indicate that either the pre-iron horizon at the site had some lithic component or these pieces were the survival of early cultural horizon. There is reason to believe that during the Mesolithic period the area was within the operational zone of the Mesolithic hunter-gatherers. In this connection it may be pointed out that a Mesolithic site (Nibikalan) was discovered at a distance of about 3 km eastward from the Samudrakup mound of Jhusi earlier.

Of the structural activities associated with the period, mention may be made of post-holes, floors

Plates 65-66



65



66

Jhusi : 65, incised pottery, pre-NBPW period and 66, terracotta human figurine

and hearths. The occurrence of burnt clay lump with reed or split bamboo impression clearly suggest that people of the concerned period used to construct their houses with reed, bamboo, etc. The screen walls of these thatched houses used to be plastered with clay.

An interesting feature of this season's excavation was the exposure of whitish deposit resembling lime, though in course of excavation it started showing ashy character. The exact nature of this deposit is yet to be ascertained.

Sub-phase B is a deposit of 1.2 m comprising eight layers from 45 to 52, characterized by the presence of iron. The ceramic assemblage of this sub-phase included black-slipped ware, black-and-red ware and red ware. The last group is further sub-divisible into a number of groups, such as chocolate, orange or ordinary red ware. Functional types consisted of various types of bowls, dishes, basins, medium-sized vases, storage-jars, etc, The black-slipped ware occasionally resemble the NBPW as the sherds were lacking the finish, firing and high workmanship of the latter. The available evidence suggests that the NBPW evolved from the black slipped-ware as both shared a number of fundamental types like bowls, dishes, basins, etc.

Antiquities from this pre-NBPW phase include iron and copper objects, bone objects, beads made on semiprecious stones and terracotta, etc. Animal bones were also found in profusion. The species identified included cattle, sheep, goat, pig, etc. Bones of aquatic creatures like turtle and fish were also obtained. This cultural sub-phase also yielded cereals like wheat, barley, rice, *moong,* mustard, etc.

Of the structural evidence exposed from this sub-culture, mention may be made of hearths, hutments, etc. No baked brick was found from this horizon. The available evidence suggests that people were constructing wattle-and-daub houses. Hearths have yielded animal bones: charred, semi-charred and uncharrd, suggesting the use of animal flesh as an important dietary item of these people.

The combined testimony of all the three trenches revealed a 5.84 m habitation deposit ascribable to NBPW period. This deposit was divisible into twenty-four layers from 21 to 44. From the NBPW deposit were found potsherds of NBPW, black-slipped ware, red ware and occasionally black-and-red ware. The red ware assemblage was further sub-divisible into a number of sub-groups on the basis of surface treatment, firing and fabric of the pots. The functional types associated with this deposit included bowls and dishes of different variety, basins, vases, storage-jars, etc. Though majority of the pottery was wheel thrown a few examples of hand-made pottery was also met with. Some of the NBPW sherds bore paintings as well while some pieces of this ware exhibited double colour scheme.

From the earlier phase of NBPW evidence of hutment in the form of wattle-and-daub and hut floors were found, but from the mid-phase burnt-bricks also started appearing. Ring-well constitute a characteristic feature of this cultural horizon. The antiquities recovered from this phase include iron and copper objects, bone objects including bone arrow-heads and a few coins. Beads fashioned on semiprecious stones like chert, chalcedony have also been found. Terracotta beads, particularly the *ghata-shaped* ones were also encountered. Terracotta human figurines were also found from the NBPW phase (pl. 66).

A corpus of animal bones was obtained from the excavation. The identifiable animal species included those of cattle, buffalo, sheep, goat, pig,

etc. Bones of aquatic creatures like turtle and fish have also been obtained. The bones are often found in charre or semi-charred condition with cut marks indicating thereby consumption of flesh by the people. From a burnt horizon ascribable to the mid-phase of NBPW, charred grains were found in profusion. The identifiable grains include wheat, barley, *moong,* mustard, rice, etc. The available evidence clearly indicates that people were domesticating different species of animals and they were cultivating a number of crops as well. The available grains indicate that both *kharif* 'and *rabi* crops were cultivated.

The NBPW deposit at the site measured 5.84m in thickness. This deposit witnessed the beginning and end of the NBPW culture at the site. The excavation confirmed the result of the last year showing the occurrence of burnt-bricks. The available evidence suggested the use ofburnt-brick at the site which might be traced back to the middle-phase of the NBPW culture. The occurrence of coins is also ascribed to the same phase.

Excavation at Jhusi revealed a pre-NBPW culture deposit, divisible into two sub-groups, IA and I B on the basis of non-availability and availability of iron respectively. This point is significant as till recently it was a prevalent notion among the archaeologists and historians alike that large-scale habitation in the area concerned could be traced back only to the NBPW period. The excavations at Jushi have established not only the existence of the pre NBPW deposit at the site but it also indicated that the area was in constant occupation for a considerable length of time before the onset of the NBPW culture on the scene. The available evidence suggests that the NBPW was not an imported stuff for the site. The ware itself is likely to have evolved out of the black-slipped ware assemblage available from the site. The excavation at Jhusi this year confirmed the earlier observation that the site contained a good deal of Chalcolithic material, exact nature and extent of the Chalcolithic horizon would be established only by further excavation at the site.

The available evidence at the site suggests that at the base of cultural history of Jhusi there may be Mesolithic core, a point which is indicated by the occurrence of not only flakes and flake fragments but by finished tools as well.

65. Exploration in the Vindhyas and the Ganga Valley, District Allahabad

The Department of Ancient History, Culture and Archaeology, University of Allahabad, Allahabad conducted archaeological explorations in the valleys of the Belan, Adwa and Seoti in Mirzapur in the Vindhyan area and in the Ganga valley in District Allahabad.

The explored sites range from Mesolithic to historical periods. From the Vindhyan area, sizeable number of explored sites belonging to Kotia group of Megalithic culture were noticed. Some of the Megalithic sites have yielded not only pottery but megaliths as well, though in the highly disturbed condition. The site of Tonkwa on the confluence of Adwa and Belan is a significant discovery. It yielded both Neolithic and Chalcolithic material. The Neolithic pottery of the site belongs of Koldihwa-Mahagara group where excavations have already taken place, as a result of which the contours of Vindhyan Neolithic culture is well indicated.

The explored sites and associated materials are as under:

District/Site	River Valley	Nature of remains ^^H
Allahabad/Daya	Belan	Kotia pottery
Allahabad/Gaddopur	Ganga	Pottery
Allahabad/Hadigahna	Ganga	Kushan pottery
Allahabad/Lohraunha	Belan	Kotia
Ayodhia	Belan	Microliths, Kakoria type pottery
Badauna	Belan	Neolithic and Chalcolithic pottery
Barhwari	Belan	Chalcolithc, Kotia
BijaliKota	Seoti	Kotia pottery
Dramadganj	Adwa	Kotia
Galra	Seoti	Pottery, microlithis, bricks
Garhwa	Belan	Microliths, Kotia pottery
Ghurhati	Belan	Kotia pottery
Kapasi	Belan	Mesolithic, Kotia pottery, iron slag, historical
Kedwar	Belan	Kotia pottery
Kharihat		Kotia
Kotar	Adwa	Kotia
Kothi	Belan	Kotia pottery
Mirzapur/Ghurhai	Belan	Kotia
Mirzapur/Muralia Jungle	Seoti	Kotia pottery
Mirzapur/Pandepur	Belan	Kotia
Mirzapur/Rateh	Seoti	Kotia pottery, glass beads, megalithis
Mirzapur/Tonkwa	Belan-Adwa Confluence	Neolithic/Chalcolithic
Nevarhiya Bayalis	Belan	Kotia
Semoriha	Belan	Kotia pottery, bangle and microliths
Sothia	Adwa	Kotia

66. EXPLORATION IN DISTRICT AZAMGARH

Under village-to-village survey, M.K. Dwivedi of the Patna Circle of the Survey, explored the area of Lalgunj tehsil of Azamgarh district and reported the following sites:

Village	Nature of remains ^^H
Badegaon	Neolithic tools
Bahadurpur	Ruined temple of thirteenth century
Balipur	Ruins of a temple, sandstone image of Hindu gods
Banarpur	Ruins of mosque of Mughal period
Burki	Stone images of Hindu deities
Chewar	Sandstone image of Surya, Vishnu, Uma-Mahesvara image, datable to tenth-eleventh century
Dobhanpur	Sandstone image of gq/a-Lakshmi
Gobar	Mound of medieval period
Jamasir	Mosque and graves
Karia Gapalpur	Mound, black-and red ware
Kasba Deogaon	Ancient fortification and mosque
Rampur Katharwa	Mound, sandstone image of Mahishasurmardini of tenth-eleventh century
Salempur	Uma-Mahesvara and other images in sandstone
Uchegaon	Extensive mound, terracotta figurines of third-fourth century

67. EXPLORATION IN DISTRICT ALMORA

Under sporadic survey, Vishnu-Nag-Devta Temple in Village Dol, near Shahar-Phatak, Syahi-Devi Temple near Sheetla Khet and Binsay - Mahadev Temple in village Phaltia near Bhanoli in District Almora, were locally visited by the Regional Archaeological Unit, Almora, under the direction of Rakesh Tewari. Vishnu-Nag-Devta is a modern temple, but there is an image of standing four-handed Vishnu, belonging to medieval period presently under worship. In the temple of Shyahi Devi, there are remains of an early medieval temple built *mpidha* style, but it was completely reconstructed during the later period. There are stone images of Mahishasuramardini and Ganesa *of circa* ninth century AD, lying there under worship. The Binsay-Mahadev Temple near Bhanoli is completely damaged. There are two important stone images of Sun and Vishnu, belonging to *circa* eleventh century.

68. EXPLORATION IN DISTRICT ALMORA

An exploration was conducted between Someshwar and Girechhina along the Mansari-Nala, a tributary of the River Koshi, in tehsil and District Almora by Jeewan S. Kharakwal of the Rajasthan Vidyapeath, Udaipur, in order to locate ancient metallurgical and burial sites. The following smelting sites were discovered:

Raulakundi (fig. 30), an iron smelting site, is located about 50 km north of Almora town near village Bhool gaon. The site is locally known as Raukuri and the cultural deposit measures about 1 m. It is spread over an area of about 90 sq m on a rocky protuberance oriented north-east and south-west.

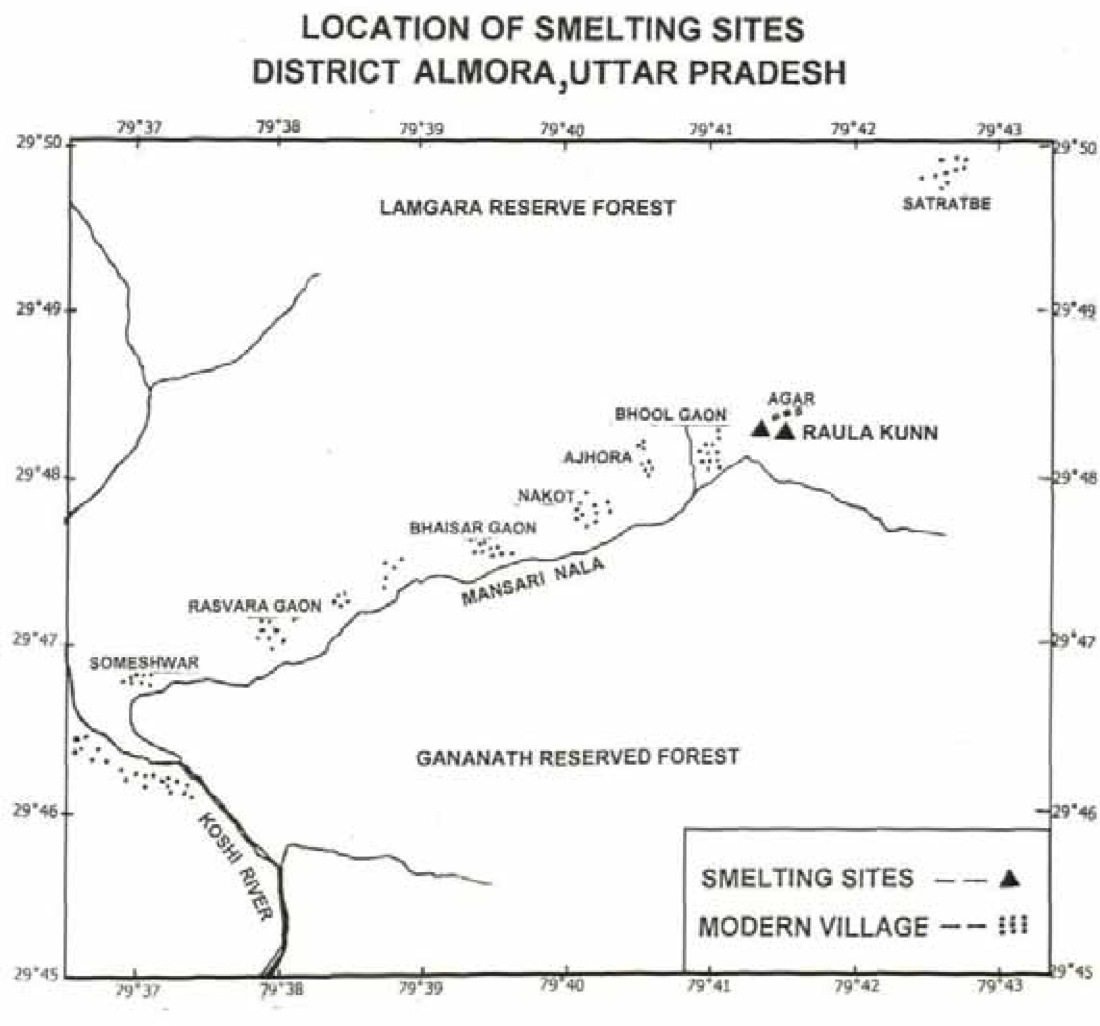
Three large dilapidated complexes, made of locally available quartz, quartzite and garnetiferous schist and oriented roughly NE-SW, were visible on the surface. All these structural-complexes are parallel to each other and the first one measures 10 X 4 m (western), second one 16 X 9.50 m (in the middle) and the third 15 X 6 m (eastern one). Each complex contains several squarish rooms and the average thickness of walls was found ranging from .70 m to 1 m. A large heap of iron slag was found on the eastern margin of the site, which, according to the villagers, was dumped by the farmers from their agricultural fields located around the site. Close to the heap of slag, a stone wall belonging to a different structure was found, which has survived to a length of 3.50 m and height of 1.40 m. A large amount of iron slag, found on northern, eastern and southern slopes, apparently suggests that it was thrown from the site situated on the top. In addition to this a large quantity of slag was also found scattered on the agricultural terraces located on the slopes.

A small squarish stone structure at the eastern corner of the third structural-complex, measuring 2 x 1.80 m was suspected to be smelting furnace as considerable amount of slag and a few fragments of gossan were noticed. The average thickness of walls of this structure was found 80 m. A charcoal sample was also collectd from this structure which has been sent to Physical Research Laboratory for C-14 dating.

A conical pit dug out in a rock was found on the eastern margin of the site, the diameter and depth of which were measured 23.5 and 38 cm respectively. This pit appears to have been constantly used for grinding for a very long period of time as its base has turned into perforation and the entire inner surface was found beautifully polished. Similar pits, dug in hard rocks, were discovered earlier from several smelting sites in Kumaon region. It appears that this kind of pits may have been used for grinding ore or gossan. A hammer-cum-muller made of quartz, possibly used for grinding, was found close to this pit. Besides these, a fragment of an engraved stone object was also found.

The ceramic assemblage is represented by red ware, grey ware and stone ware. The stone ware is represented by only one fragment of a shallow bowl with flared sides and rim flattened on top. It is made of locally available soft stone. The red and grey wares were made of fine clay to which was added sand and grass as tempering material. In case of red ware it was fired at a high temperature, as the oxidized core would indicate. This ware is represented by small and medium-sized jars, bowls, deep basins and spouted pots. A rim fragment of bowl in fine fabric was also found, treated with red slip externally. It also bears black painting on red slip. The grey ware is also represented by small and

Fig. 30


LOCATION OF SMELTING SITES
DISTRICT ALMORA,UTTAR PRADESH
LAMGARA RESERVE FOREST
SATRATBE
AGAR
BHOOL GAON
RAULA KUNN
AJHORA
NAKOT
BHAISAR GAON
MANSARI NALA
RASVARA GAON
SOMESHWAR
GANANATH RESERVED FOREST
KOSHI RIVER
SMELTING SITES
MODERN VILLAGE
29°50
29°49
29°48
29°47
29°46
29°45
79°37
79°38
79°39
79°40
79°41
79°42
79°43

medium-sized jars with everted rims. Few fragments of gritty grey ware were also found. Their shapes could not be determined. The entire assemblage is datable to medieval period.

Agar is located about 1 km west of Raukuri. The site is spread in an area about 1 acre and it is entirely reoccupied by the modern settlement. A massive heap of iron slag was found on the eastern margin of the village besides those scattered on the agricultural terraces. It also yielded red and grey ware potsherds similar to the one found at Raulakundi or Raukuri.

The local villagers recounted that prior to the Gorkha's rule in Kumaon (AD 1790-1815) Agari and Samyo people were living in this area and they were engaged in iron, copper and gold mining and smelting. The ceramic assemblage also supports this myth. It is said that the authors also brought the Saim deity from Jhakar Saim and enshrined close to the site at Raulakundi. They were mining iron ore from the adjacent mountain and copper ore from Jogyura-ka-Udyar, located close to the site.

The villagers at Rasyara-gaon claim to have seen rectangular burials on the exposed section of aggradational terrace of Mansari-Nala. Although nothing was noticed, yet their description was identical to those discovered at Ladyura, Purara, Gagrigol besides several other megalithic sites.

69. Exploration in District Bahraich

D.R Tewari of the Department of Ancient Indian History and Archaeology, University of Lucknow, Lucknow, assisted by Akhilesh Kumar Verma, conducted the village-to-village exploration in Bahraich. The following sites of archaeological importance were discovered.

District/Site	*Name of Block*	*Nature of remains*
Amraiya	Balha	Red ware, medieval
Arai kala	Fakharpur	Red ware, Kushan
Ashokha	Chittaura	Red ware, Kushan
Baragunnu	Chittaura	Red ware, medieval
BishunpurRahu	Chittaura	Red ware, medieval
Charda	Babaganj	NBPW, black-slipped and red ware
Chardaha Chandan	Chittaura	Red ware, medieval
Dharmanpur	Chittaura	Red ware, Kushan and medieval
Diha	Chittaura	Red ware, medieval
Gangapur	Fakharpur	Red ware, medieval
GodaniBasahi	Chittaura	Red ware, Gupta
HaivatpurDihwa	Fakharpur	Red ware, medieval

District/Site	*Name of Block*	*Nature of remains*
Hakimpurwa	Balha	Red ware, terracotta ball, Gupta
ImlihaTand	Mihipurwa	Red ware, medieval
Itaujha	Chittaura	Red ware, medieval
Kandar	Chittaura	Red ware, terracotta disc, Gupta and medieval
Khalidpur Dihwa	Fakharpur	Red ware, medieval
Khapurwa Dihwa	Fakharpur	Red ware, medieval
KilaBagh	Mahsi	Red ware, medieval
Kuttibagh	Mahsi	Red ware, medieval
Lakarihara Baba	Mihipurwa	Red ware, Kushan, Gupta
Mahmatpur Unchwa	Balha	Red ware, terracotta ball, Gupta
Mahsi	Mahsi	Red ware, medieval
Mithana	Nawabganj	Red ware, medieval
Musgara	Chittaura	Red ware, medieval
Nahsutiya Dhidhoran purwa	Chittaura	Grey ware, black-slipped ware, red ware
NakaihaDiha	Chittaura	Sunga-Kushan and Gupta red ware, medieval
Narainapur	Chittaura	Red ware, medieval
Narainjot	Nawabganj	Red ware, medieval
Narauli	Chittaura	Red ware, medieval
Paltan Purwa	Babaganj	Red ware, medieval
Rahwa Bishunpur	Chittaura	Red ware, medieval
Ramapur Kindhauli	Fakharpur	Red ware, Gupta
Salarpur	Mihipurwa	Red ware, Gupta
Shaikhawapur	Chittaura	Red ware, medieval
Singaparasi	Chittaura	Red ware, medieval

District/Site	Name of Block	Nature of remains ^^H
Shyampur Nadauna	Chittaura	Red ware, medieval
Tazwapur	Tazwapur	Red ware, Gupta and medieval
Tedwa Bazar	Tazwapur	Red ware, medieval
Temariha	Chittaura	Red ware, medieval
ThalihaDihwa	Fakharpur	Red ware, medieval
Tikuri Bhawaniya pur	Nawabganj	Red ware, grey ware, black-slipped ware

70. EXPLORATION IN DISTRICT BARABANKI

D.P. Tewari of the Department of Ancient Indian History, Culture and Archaeology, University of Lucknow conducted explorations in Tehsil Ramnagar and discovered the following sites of archaeological importance.

Village/Site	Nature of remains
Achhechha 27° 03' 35" N; 81° 17 05" E	Red ware of medieval period
Amolikalan 27° 05'45" N; 81° 21'37" E	Red ware of medieval period
Amolikiratpur 27° 06'20" N; 81° 22'50" E	Red ware, carved bricks with floral designs of early medieval period and medieval period
Baddosarai 27° 01'05" N; 81° 28'E	Red ware, glaze ware, ruins of *lakhauri* brick structures of medieval period
Dadaura 27° 02' 20" N; 81° 22' 80" E	Red ware, a brick temple with a shiva *linga*
Basauli 27° 11'55" N; 81° 17'35"E	Red ware, brick temple and *Siva-linga* in garbhagriha. few copper coins of medieval period
Devasani 27° 06' N; 81° 23'05" E	Red ware of early medieval period
Dharmsala 27° 07'05" N; 81° 02 15" E	Ruins of *lakhauri* brick structures and a tomb

Village/Site	*Nature of remains*
Ganeshpur 27° 06'45" N; 81° 27 20" E	A Siva **temple** with icons **of *nandi,* Karttikeya and** ParvatiSamvatl886.
Gaura 27° 07 52" N; 81° 20'E	Red ware, glazed ware, stone slab, broken part of temple *amalaka* medieval
Kanakpur 27° 10'26" N; 81° 17 04" E	Red ware, glazed ware coated with multiple colour, medieval Period
Kandraul 27° 08'40" N; 81° 20'27" E	Brick temple with *Siva-linga* in *garbhagriha,* a small inscription on the wooden panel of door, red ware and glazed ware
Kanp (Itahua) 27° 01'57" N; 81° 24'18" E	Red ware, terracotta balls, beads and stone pestle
Kintur 27° 01'10" N; 81° 29'20" E	Red ware, glazed ware, ruins *of lakhauri* brick structures, modern brick temple with a *Shiva-linga* in sand stone.
Laghukurukshetra 27° 08'15" N; 81° 24'40" E	Undulating land comprised of modem temples, an ashram, a tank and a well.
Lathimarwa (Garri) 27° 08'25" N; 81° 24'55" E	Red ware of medieval period
Mahadeva 27° 07 N; 81° 25'20" E	Red ware, glazed ware, structures *of lakhauri* bricks and kankar slabs
Malauli 27°15"N; 81°12'10"E	Red ware of medieval period
Mansaram Baba-ka-Tila 27° 04'05" N; 81° 20'05" E	Red ware, terracotta figurines, gamesman, bangles, dabbers
Rampur 27° 07 25" N; 81° 21'55" E	Red ware of medieval period
Semrai 27° 07 55" N; 81° 21'03" E	Red ware, glazed ware, *kankar* and brickbats of medieval period

Village/Site	*Nature of remains*
Silauta (27° 03'25" N; 81° 26'45" E)	A brick temple with *Siva-linga,* an icon of chaturbhuji Vishnu in *varada-mudra* holding *gada* in upper and *sankha* in lower left hands, flying *vidyadharas* on top and *vyala,* figures on both sides; mosque with inscription in Urdu script; three *lakhauri* brick temples comprising *chaturmukhi Siva-linga* with the image of Siva-Parvati, few copper images of Hindu deities, AD 1200
Sihamau (27° 02'35" N; 81° 25'05" E)	A brick temple of *lakhauri* bricks with *Siva-linga* and iconofParvati
Sheikhpur (27° 06'45" N; 81° 17'20" E)	Red ware of medieval period Sayyed Masauddin
Tilokpur (27° 03'50" N; 81° 18' 17" E)	Brick temple with the icon of Neminata on *kasauti* stone with an inscription on the pedestal dated *Samvat* 1157; brick temple *of lakhauri* bricks with stone image of Vishnu in standing position holding *gada* in right and *chakra* in left hand, bearing *vanamala, kirita, kundala* and *yajnopavita.* The remains assign to tenth century AD

71. EXCAVATION AT MALHAR, DISTRICT CHANDAULI

Rakesh Tewari and R.K. Srivastava, assisted by K.K. Singh, Rajiv Trivedi, Balram Krishna, Ram Gopal Misra, M.M. Dimari and Ramaji of the State Archaeology Department, Government of Uttar Pradesh, undertook excavation at the ancient site of Malhar. This site is located on the left bank of the River Karamnasa near Musakhand dam in Chakia tehsil of District Chandauli. The excavations were carried out with a view to ascertaining the antiquity of the early Iron Age deposit. Two habitation areas, i.e., MLR-II and I were encountered, besides a small mound located about 300 m south of MLR I bearing a heap of iron slag. In all twelve trenches covering an area of 387.33 sq m were excavated. Total habitation deposit is divisible into four cultural periods.

1. Pre-IronAge
2. Early Iron Age
3. NBPW
4. Early historical

It may be noted that the deposits of earlier two periods were revealed at Malhar II and the latter two at Malhar I. The cultural deposit of Period I comprising layer (4) is 45 cm thick. Black-and-red ware, red ware and a few black ware sherds represent this peirod. The main shapes include dish-on-stand, lipped-bowl, perforated and footed-vessel, shallow bowl and water vessels. The black-and-red, and red ware sherds with cord impression on their exterior

are present in considerable proportion. A few painted and incised sherds were also found. Often their exterior is rusticated or treated with a red slip. Most of the sherds are wheel-thrown while a few hand-made examples are also present. Burnt-clay lumps, some of them with bamboo and reed impressions indicate that the first settlers at this site used to live in huts made of wattle-and-daub. No evidence of floors and post-holes could be found because of the limited area available for excavation and that too disturbed by pits. The subsistence pattern appears to have been based on hunting and agriculture. The bones revealed in considerable number and a few of them are charred while some of them bear cut marks. Charred grains and other botaincal remains are also collected by floatation method. Other antiquities comprise stone pieces, bone arrow-heads, a few terracotta and stone beads and bladelets, besides a few slags (restricted to the upper levels only).

Period II (layers 1 -3, MLR I) comprises 65-70 cm thick deposit. This period is represented by the presence of iron slag, iron artefacts, furnaces for iron smelting and forging. The iron artefacts include nail, spear-head, arrow-head, chisel, etc. It may be noted here that iron slag and artefacts were traced from the lower to the upper levels. Ceramic industries of this period include black-slipped ware and grey ware in addition to black-and-red and red wares. It may be noted that black-and-red ware of coarse and thick variety are restricted to lower levels of this period. However, their finer variety continued in upper levels also. Dishes are represented in all the ceramics, except the black ware, deep bowl, beaker, corrugated bowl, vase, basin, etc, comprise other shapes.

Three successive rammed-floors along with a few post-holes, besides burnt-clay lumps with bamboo and reed marks clearly indicate that the huts of this period would have been made of wattle-and-daub. The noteworthy antiquities of this period are bone arrow-head, terracotta and stone beads, nail and a celt, copper objects, heavy duty tools. Apart from the bones in large quantity, including charred and those bearing cut marks, charred botanical remains and a few microliths were also found.

Periods III and IV are represented by NBPW, red ware sherds of second century BC to second century AD, a terracotta figure of Lakshmi datable to second century AD. However, the deposits of these periods were found to be disturbed due to large pits.

72. Excavation at Bisokhar, District Ghaziabad

The site at Bisokhar lies in one of the cultivated fields of village Bisokhar (28° 5 *V* 15"N; 77° 35' E). In a chance discovery some beautiful sculptures in sandstone and lintels, door-jambs etc. of a Hindu temple of Pratihara period were found.

With a view (i) to study the actual nature of the structures, if any, at the find spot of the sculptures, and (ii) to find out any other related material of the temple, the Excavation Branch-II, New Delhi, of the Survey, under the direction of Madhu Bala, examined the temple remains and carried out excavation with the assistance of Vishnu Kant, Ajay Kumar, Vinod Kumar, V.P. Verma, Ram Kumar, Subhash Chandra and Chhote Lai.

The excavation revealed a step-well (pi.67), a circular type burnt-earth structure (pi.68) and some other architectural remains from the loamy deposit. It seems that the other structural evidence which were under a metre from the present ground level, were destroyed for agricultural operations by the villagers and as such no plan of the temple could be traced out.

Plates 67-68



67



68

Bisokhar : 67, excavated step-well and 68, circular structure of burnt-earth

The exposed step-well (figs. 31-32) has steps with an average rise and tread of about 20 cm and 25 cm respectively. The height of rise was maintained by brick-lining below stones. The available total height of steps is about 6.30 m and total available length with the wall is about 8.80 m. The 1.5 m broad steps have a 80 cm wide brick-retaining wall on both sides, the lower 24 step with side retaining wall is connected with the well having a dia of 4.5 m

Most of the steps are made of locally available *kankar* stone slabs. However, later on, some of the steps were replaced by the slab of the disused temple remains. In this series 9, 10, 13, 16, and 24 steps are fully or partly replaced. The 9 step is of red sandstone slab with decorated *kunjaraksha* type design. The lime-concrete-plaster was used to seal the corner joints and other joints of the steps for watertightening.

A profusely carved porch pillar adorned with the pillar, *kirttimukha* capital and *ghatapaIlava* at the middle was found fixed in a reused position as an easternside door-jamb for a small passage of the size of 1 m X 1.54 m and was closed later on. It seems that due to heavy water thrust the step-well as well as temple was damaged. Later on, step-well was repaired by the readily available material at the site, i.e., temple remains, brick-debris etc.The architectural pieces of the temple were reused as per the requirement of the stones in the present available step-well at a late stage. When the area of step-well was filled up it appears that the well-shaft was raised and used by the people.

From the loamy deposit over the lower steps, two fallen architectural pieces, the first one is a door lintel and other one is a pilaster were collected. Some fragments of decorated bricks were also collected from this area.

In the eastern side of the step-well, remains of a circular type burnt hearth was unearthed. The outer and inner diameter are 1.80 and 1.5 m respectively. The available height of structure is about 3 to 5 cm. According to the villagers from this place pure ash was scooped out in a huge quantity in June 1998. This structure at the site was popularly named as a *Hawan Kund.*

About sixteen architectural fragments are found from the temple site at Bisokhar. Out of these, three door-lintels, three door-jambs, two pprch pillars, two pilasters, one Ganesa panel, two Krishna Lila panels, one decorated slab, one louts medallion and one *pranala* (part of drain) with other plain slabs are found. Amongst these, one door lintel decorated with various incarnations of Vishnu *(Dasavataras,* i.e., Matsya, Kurma, Varaha, Narasimha, Vamana, Parasurama, Rama, Balarama, Buddha and Kalki) (pl. 69). The door-jambs are ornamented with *makarvahini* Ganga and *kurmavahini* Yamuna at the lower portion (pl. 70) and profusely carved porch pillars decorated with *kirttimukhas* and *ghatapallava* designs (pl.71). Krishna Lila panels bear the scenes of *dhadhi-makhana, putanavadha, yamalarjuna yuddha, saktasuravadha, dhenukasuravadha, kaliyamardana,* raising of *govardhana parvata,* etc.

There is another unique Ganesa panel which shows seven four-armed images of Ganesa in sitting posture.

The step-well was a part of the temple of the ninth century AD. The sculpture found here are one

Fig. 31

BISOKHAR, 1998-99 DISTT. GHAZIABAD (U.P)

PICTORIAL VIEW OF STEPWELL

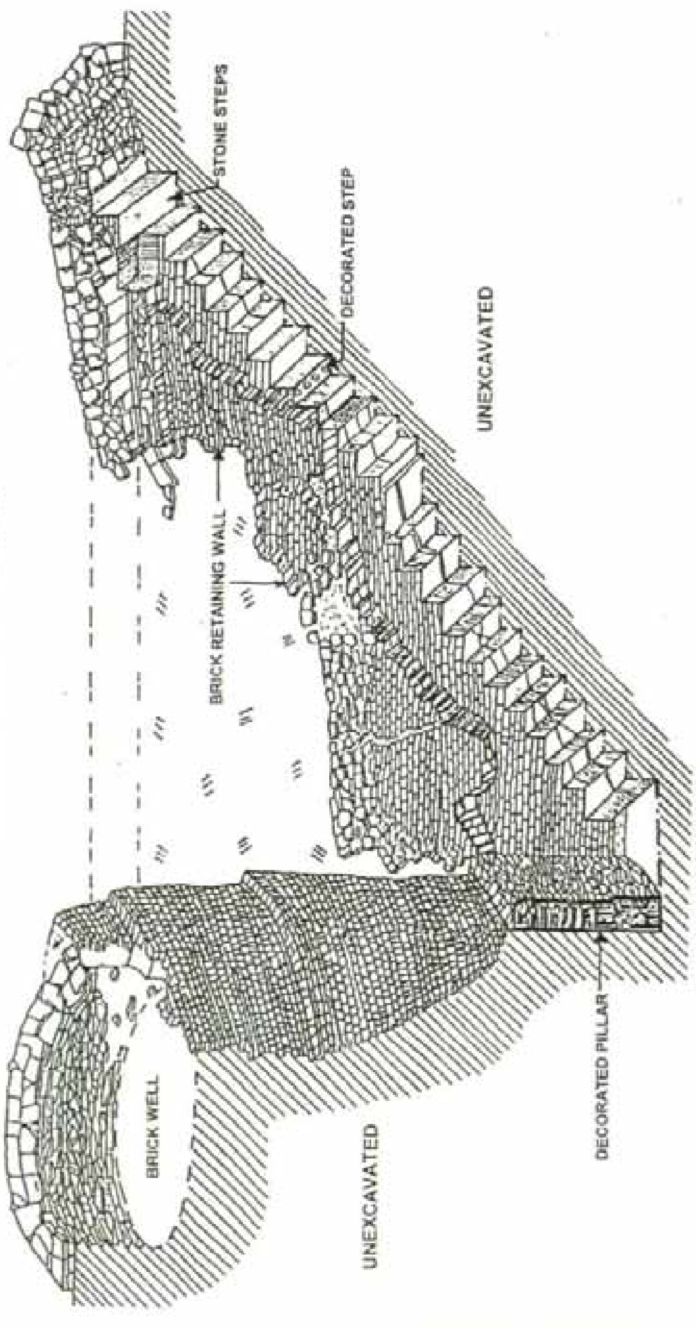


Fig. 32

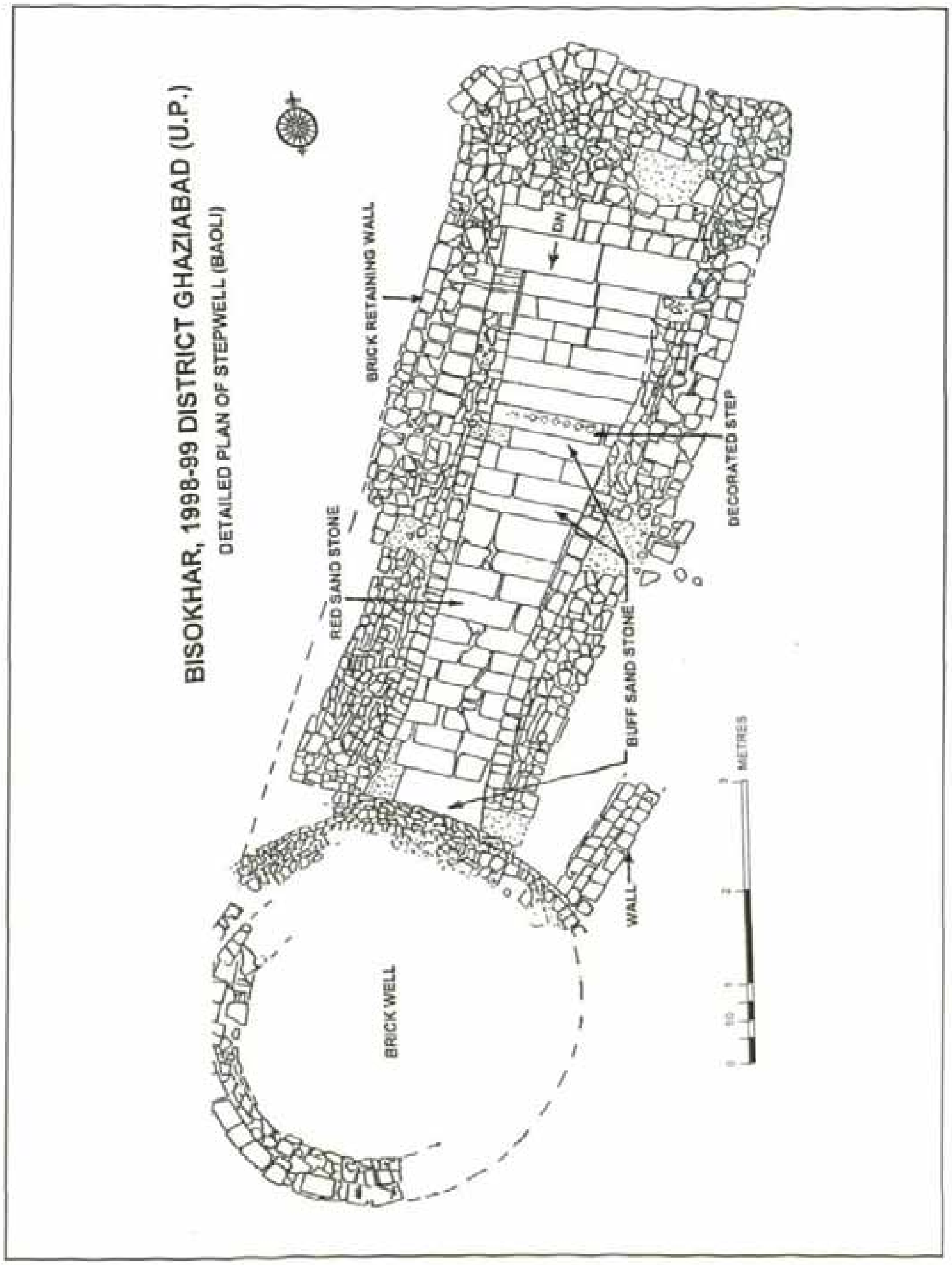
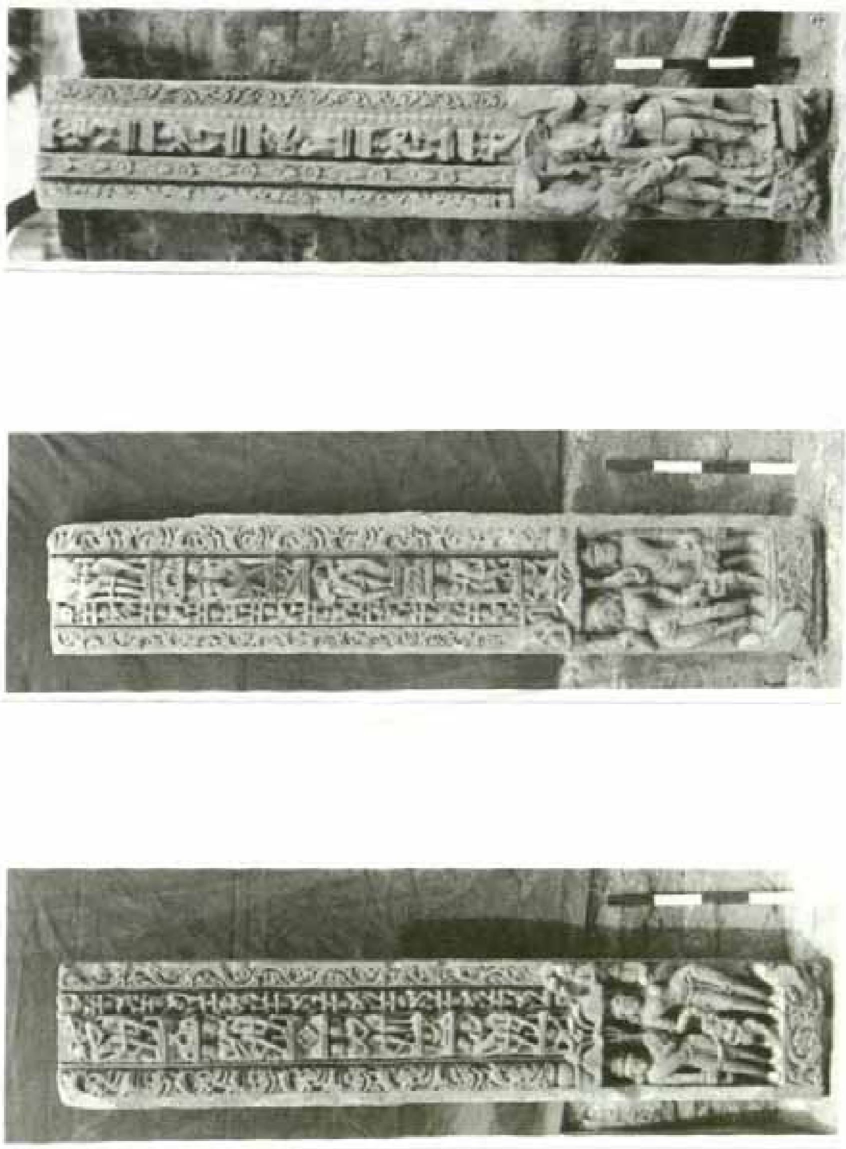

BISOKHAR, 1998-99 DISTRICT GHAZIABAD (U.P.)
DETAILED PLAN OF STEPWELL (BAOLI)
BRICK RETAINING WALL
DN
DECORATED STEP
RED SAND STONE
BUFF SAND STONE
WALL
BRICK WELL
METRES

Plate 69



Bisokhar : door-jamb and lintel decorated with Dasavatara scene

Plate 70

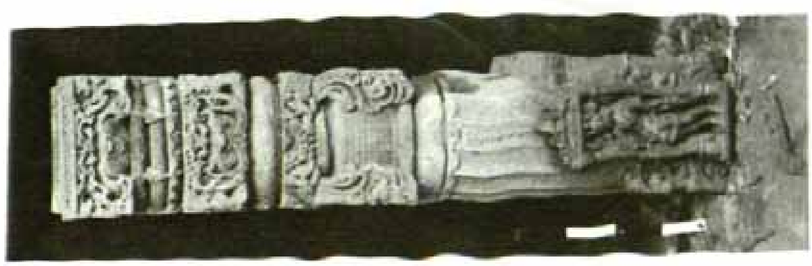


Bisokhar : door-jamb with *makaravahini* Ganga and *kurmavahini* Yamuna

Plate 71







Bisokhar : porch pillar and pilasters

of the finest examples of the Pratihara sculptural art. Possibly, this step-well was used for taking water for worship and also to take holy bath at the temple site. It appears that even after the temple came into disuse the step-well continued to be in use for a considerable period of time.

73. Exploration at Sapaur, District Gonda

The ancient site of Sapaur situated (27° 20' N; 81 ° 47' E) in Colonelganj tehsil, is a part of revenue village Hardia of Paraspur block. This site is about 120 km east of Lucknow and 18 km south of Colonelganj tehsil headquarters. It is approachable by Colonelganj-Belsar metalled road upto Paraspur and a *kharanja-cum* cart track of 3 km bifurcated from village Charahuwan.

The present village of Sapaur is located in the middle of an ancient mound, rest of the area is under cultivaiton. The size of the mound is about 400 x 200 X 5 m. It is surrounded by two *nalas* known as Kakarahia Nala from three sides, which joins River Terhi in the east. A mosque and tomb of a few*fakirs,* a *than* of Sammai Mai and a *Sivz-linga* of sandstone locally known as Mahadeva are being worshipped by the local residents on this mound.

Traditionally it is believed that *thepaumnic* king Nahusha through rigorous penance obtained the status of Indra. Once upon a time he hed a sensual desire for Indrani. He sat in *apalki* carried by Rishis to meet Indrani. While moving from Ayodhya he came to this place and ordered Rishis to move fast *"sarpa sarpa chalo"*. The Rishis out of anger cursed him to become a snake. Some others believe that the snake is the *grama devata* of this place, and therefore, it was named as Sapaur, abode of snakes.

The Department of Ancient India History and Archaeology, University of Lucknow, under the direction of D.P. Tewari, assisted by Durgesh Srivastava and some other students explored the district under village-to-village survey. They noticed NBPW along with the remains of medieval settlement. On the basis of the archaeological material and geographical situation of the site it was decided to carry out scientific excavation to confirm the chronological sequence of this area, specially in Saryu-Terhi Doab. The excavation was carried out by the Lucknow Circle of the Survey, in joint collaboration with the Department of Ancient History and Archaeology, Lucknow University.

Seven trenches of 10 x 10 m were laid out on different parts of the mound. Trench A1 was laid on the topmost elevated portion of the centre of the mound. Trench YF 17 in north-west, XJ 4 in south-west, L5 in south-east and rest of the three Trenches ZJ4, ZJ5 and ZK 5 in eastern part of the mound, locally known as Jharkhandi Mahadeva. All the trenches except Jharkhandi Mahadeva were excavated upto the natural soil/water level in a limited area of 5 X 5 m.

A four-fold cultural sequence was obtained during the excavation. The dates are decided on typological basis of pottery, terracotta human and animal figurines, sculptures, carved bricks and coins.

The Period I is represented by NBPW, black-slipped ware, grey ware and red ware. The NBPW is found in different shades, i.e, golden, steel blue, coal black, chocolate and silver hue. The fabrics are medium-to-fine and are well-baked at high temperature and produce metallic sound. The main

utilitatian types in this ware are dishes and bowls in different shapes. The dominating shapes are convex-sided dishes with incurved rim and flat base while the bowls in fine fabric with either straight or slightly incurved/slightly everted rim and flat rounded base. The corrugations and paintings are also found on the exterior of these pots. The second pottery type found here is red ware in majority.

The red ware is found in two types: (a) dull red ware, medium-to-coarse fabric, not well-levigated, fired at medium-to-low temperature, hand-made and wheel-turned. The main shapes are vases, carinated *handis,* storage-pots, troughs and miniature pots. Sometime the nail impressions, rope designs and cord marks are also found on the exterior. Some of these are decorated with non-geometric designs.

The other variety, i.e., (b) fine red ware, made of well-levigated clay, wheel-turned, fired at high temperature, treated with fine red slip and some times painted with black bands. The main shapes in this ware are convex-sided dishes with incurved rim and flat base, bowls with straight/globular/convex profile and featureless/incurved/slightly everted rim. The rimless *handis,* Ahichchhatra 1 OA type pots are also available in this group. The third group of pottery is grey ware, medium in fabric, hand-made and wheel-turned, plain on both sides. The main shapes are dishes, bowls, miniature pots and vases. Black-slipped ware is also found in medium-to-fine fabric, made of well-levigated clay and coated with fine black slip. The stamped and floral designs are also found on the inner part of flat bases of dishes. Few of them are decorated with nail impressed designs. The main shapes are dishes, bowls and miniature pots. The antiquities found in this cultural phases are terracotta *ghata-shaped* beads, stone beads in cylindrical, trapezoid and round shapes, terracotta animal figurines, discs, bangles, stone weights bearing red polish on both sides, beads, pestles, balls and mullers, bone arrow-heads, antlers, copper antimony rods, copper bangles, iron nails and spear-heads along with the glass bangles and glass beads. The animal bones and teeth are also found in good quantity.

The Period II at Sapaur assigned to Kushan era, is represented by red ware and black ware in medium fabric. The potsherds in red ware are made of medium grained clay and fired at medium temperature. The main shapes in red ware are bowls, basins, dishes, vases, spouted vessels, sprinklers, terracotta figurines, beads, terracotta marbles, animal bones and iron implements. The potsherds are decorated with bright Kushan red slip and stamped designs.

Period III is assignable to Gupta era, represented by red ware of medium grained clay, fired at medium temperature and sometimes decorated with linear designs. Brickbats, terracotta male and female figurines, marbles, bangles and pendants are the main antiquarian remains of this horizon. It is noteworthy that a square plan of brick temple surrounded by 75 cm wide *pradakshinapatha* was unearthed in the eastern portion of the mound with a Siva-/mga of sandstone on the surface above a big platform. The measurement of the structure was 5.30 X 5.20 m. Total twelve courses of brick structure were found. The bricks used in this structure are fired at medium temperature and measures 29 X 21 X 6 cm and 28 X 20 X 5 cm. Some of them are carved with beautiful designs. A few broken sculptures of sandstone were

also found, identified as Vishnu, female attendants and devotees.

Period IV assignable to early medieval and medieval period, is represented by red ware only. The main shapes are bowls with flaring sides and knife-edged rim, basins, troughs, carinated-Zia mfo, button-knobbed lids, vases, *kauries,* copper coin, terracotta figurines, beads and marbles etc. Some structural activities were also noticed during this period. Thick ash deposit found in this period in almost all the trenches indicates that the habitation was destroyed by fire.

The topography of the area suggests that Sapaur was situated on the bank of a tributary of Saryu in remote past. The first settlers of this area selected this land for habitation. The land was safe and comfortable for dwelling. It is evident from this excavation that the settlement started at this mound sometimes in the seventh-eighth century BC and continued upto the thirteenth century AD. The settlers of this mound shifted their habitation towards south in the last phase perhaps due to tragic fire.

74. EXPLORATION IN DISTRICT LALITPUR

The Lucknow Circle of the Survey, undertook an archaeological reconnaissance along the Betwa river valley in the districts of Lalitpur and Jhansi, under the direction of R.D. Singh, assisted by Rajeswar Pathak, Nayan Anand Chakraborty, Sangita Chakraborty and Sri. Sultan Singh.

The explored area is situated in-between (24° 30' N; 25° 45' N; and 78° 15' E to 79° 1' E) displays a unique geographical position having the Bundel Khand granite on the north covering Jhansi and its neighbouring zone and the Vindhyan sandstone in the south and south-west corner of the District Lalitpur, Towards the south, isolated patches of the Deccan Trap overlying the quartzite (metamorphosed sandstone) are noticed which had been fully exploited by the early man of this geomorphological unit. The evidences of the early human activities are encountered in the form of handaxes, cleavers, scrapers, cores, flakes, waste chips along the Lalkawa Nala (24° 32' 30" N and 78° 15' E), Erai-Ka-Nala (24° 33' E and 78° 21' E) which are the affluents of the Betwa river. Apart from that the hills between Rajghati and Naharghati Nalas, Larela-Ka-Paura Nala (exact location cannot be given due to the non-availability of toposheet in the Survey of India), Ranchchhaur-Ji-Ka Pathar (24° 28' N and 78° 15' E) are noteworthy. The artefacts found from the above mentioned sites are moderately fresh in condition and technologically they display Middle to Late Acheulian character and have been assigned a date around Middle Pleistocene period. A good number of factory waste lying scattered sometime on the higher elevated level and the slope of the hills too, and the soil constituent is predominantly of dark grey-to-black, locally known as Kabar soil, very often Mar soil is also found here and there. The surfaces of the sites are flattish with slightly undulated at places due to denudation. The sites are strewn with small and big chunks of quartz and quartzite were utilized as raw material for making pre-historic tools, they are mostly light-to-dark brown andpatinated.

Beside the pre-historic sites, a few fragmented architectural members of temple-complexes and broken sculptures of gods and goddesses of Hindu and Jaina pantheon (eighth-ninth century) have been encountered at Kunchdeon village (24° 31' N and 78° 15' E) near Deogarh and Dhaurra village near Jakhlaun in District Lalitpur.

The temples of the villages Ramnagar and Dheri, Moth tehsil, indicate late Maratha style which can be

dated back to seventeenth-eighteenth century AD.

Among the mounds, Debra Buzurg, Dhera Khera, Dheri Khera are noteworthy. A good number of medieval potsherds and *lakhauri* brick structures have come across while scraping.

75. EXPLORATION IN DISTRICT MAHOBA

In the course of village-to-village survey, Regional Archaeological Unit, Jhansi, Government of Uttar Pradesh, undertook exploration in development block of Jaitpur and along the Gunchhi river in District Mahoba.

Under the direction of Rakesh Tewari, Ambika Prasad Singh, assisted by S.K. Dubey, one hundred and twenty-five villages were explored in the region. The exploration of villages in the area revealed ancient sites, monuments, stone sculptures and other archaeological remains. Among these Jaitpur, Belatal, Mahewa, Kulpahar, Kamalpura, Purwa Jaitpur, Thurat, Bora, Narwara, Dhorra, Ghisalli, Ganj, Chhitarwara, Dadari, Paharia, Nakara are important for such remains.

Early Palaeolithic and Middle Palaeolithic tools were discovered in the valley of Gunchhi river spread over about 4 km area near Belatal railway station. The tools comprise mainly handaxe, cleaver, points, scrapers and large number of flakes, which are made of granite stone, available in abundance in the area. Mesolithic tools were also noticed in the region particularly on the foot hills. The tools are mainly non-geometrical microliths made of quartz. Middle Palaeolithic tools were also recovered in the vicinity of Kamalpura village. The tools mainly consist of handaxe, cleaver, points and scrapers. A large number of mesolithic tools were also noticed at Jaitpur village hills particularly located on the western bank of massive Belatal reservoir. Variety of tools mainly comprise non-geometrical, made on quartz. A neolithic celt was also recovered in this area.

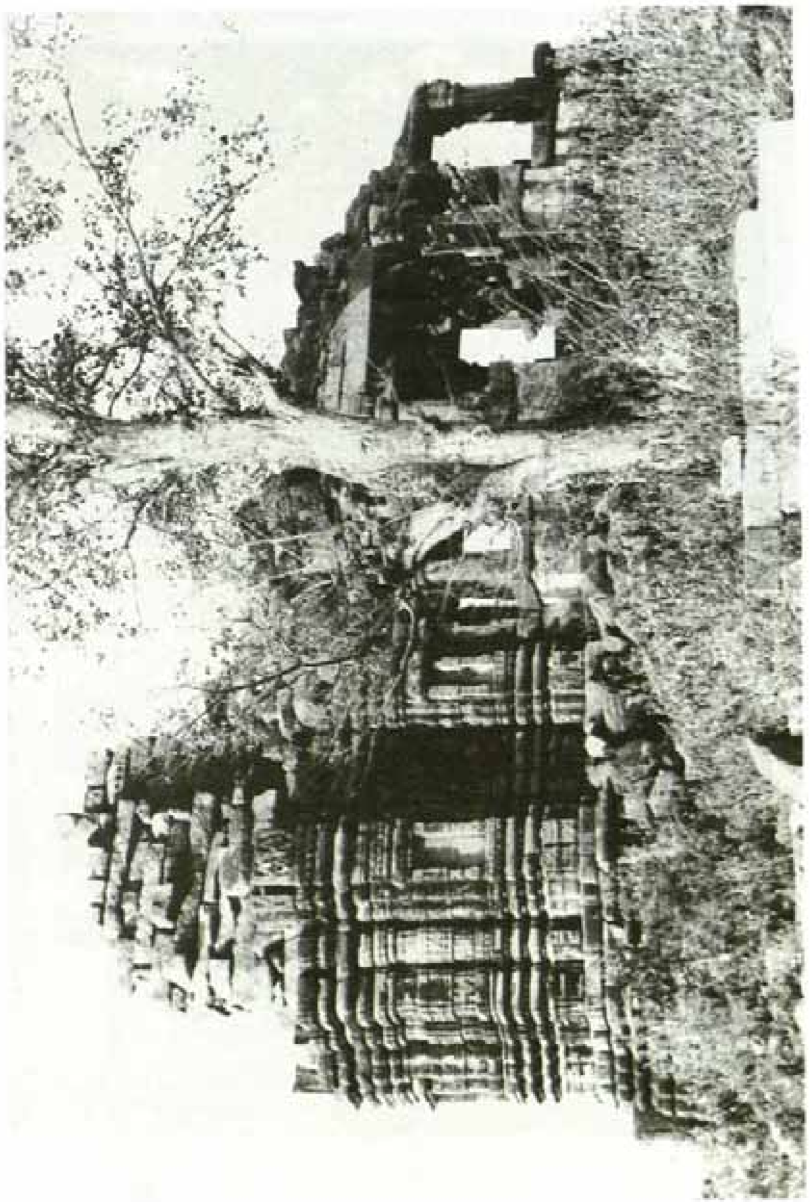
A dilapidated temple, datable to twelfth century AD, was explored from the village Narwara (pl.72). The east facing temple consists of *arddha-mandapa, vritta-mandapa* with *parsva-mandapas, antarala* and a *garbhagriha.* The *vitana* of temple is carved with a full blown lotus. The roof'of *vritta-mandapa* along with the *sikhara* of *garbhagriha* have collapsed. The pillars of *vritta-mandapa* are noteworthy in view of its decorations. The niches of *jangha* are devoid of any image except in the north-west niche which depicts a female deity.

A medieval temple known as Mar was traced in Village Ganj. Stone-built temple is based on four pillars decorated with pot and foliage designs. The temple is devoid of any deity except some stone fragments. Amongst the antiquities of the village Chhitarwara, the image of Vishnu is noteworthy (pl. 73), assignable to the *circa* eleventh century AD.

In the middle of Jaitpur village, there is a palace named Deyorhi Mahal. The main entrance gate is decorated with denticulated arch. The balcony and its nearby area is decked with wall paintings of different deities, flowers, leaves as well as birds and animals. The palace consists of two *mandapas* which are also decorated with pilasters and denticulatd arches. Nearby another palace is noteworthy, ascribed to famous beautiful dancer Mastani. The famous Mastani-Mahal is now in ruins but its entrance gate is noticable in view of its post-medieval architecture.

Dhaunsa Temple (c. seventeenth-eighteenth century AD) about half km north-east to Belatal

Plate 72



Narwara, Mahoba : Narwara Temple

Plate 73



Chhitarwara, Mahoba : standing image of Vishnu

station is also worth mention. The main entrance gate based on Maratha style, is decorated with denticulated arch. The temple consists of two courtyards, a *jagamohana* and *garbhagriha.The* images of Radha-Krishna are installed in the cella which is surrounded by a circumumbulatory-path. A small artistic hall, erected in front of the temple, is notable for its stone based geometrical designs.

During the course of exploration, the following sites of archaeological importance were reported.

Site/Village	*Nature of remains*
Ajanar	Baoli, Ruins of Garhi
Ari	Ruins of medieval temple (c. seventeenth-eighteenth cenhiry)
Baghora	Temple *(c.* nineteenth century)
Bamor	Black-and-red ware, black-slipped-ware, red ware
Belatal (around Railway station)	Early and Middle Palaeolithic tools and microlith; red ware and temple *(c.* seventeenth-eighteenth century)
Bigari	Baoli
Bihar	Ruins of a Garhi, sctti-stone and tank
Bora	Medieval temple and tank
Budhwara	Temple *(c.* nineteenth century)
Burkhera	Red ware (medieval)
Chamarua	Medieval sculptures and temple (c. eighteenth-nineteenth century)
Chhitarwara	Red ware, ruins of medieval temple, sculptures, tank, tomb.
Dadari	Black-and-red ware, black-slipped ware, NBPW, red ware and iron slag
Dhorra	Medieval sculptures and temple *(c.* eighteenth century)
Fasanabad	Baradari (c. seventeenth-eighteenth century) Medieval
Ganj	sculptures, sa//-stone Black-and-red ware, sherds of
Ghatera	NBPW Medieval sculptures and Baoli. Neolithic celt and
Ghisalli	ruins of medieval temple
Indora	

Site/Village	*Nature of remains*
Itora	Iron slag and red ware
Jagatpura	Baoli
Jaitpur	Microliths, neolithic celt, medieval sculptures, fort, palaces and temples (c. seventeenth-eighteenth century)
Kaithora	Medieval temple
Kamalpura	Middle and Upper Palaeolithic tools
Kulpahar	Palace, tanks, temples (c. seventeenth-eighteenth century)
Mahewa	Neolithic celt, black-and-red ware, black slipped ware, NBPW, red ware, iron slag
Mangrol Khurd	Upper Palaeolithic tools, red ware
Muhari	Medieval temple
Najra Dang	Ruins of late medieval building
Nakara	Medieval red ware
Narwara	Medieval sculptures and temple, Baoli, *sati-stone*
Paharia	Neolithic celt, black-and-red ware, black-slipped ware, NBPW, red ware and iron slag
Patharinavabad	Ruins of medieval temple, post-medieval temple
Purwa/aitpur	Upper Palaeolithic tools, ruins of palace and tank
Ranipura	Tomb, Baoli
Rawatpura-Khalasa	Medieval sculptures
Rikhawaha	Medieval temple
Sarangpura	Tank
Satari	Temples *(c.* eighteenth-nineteenth century), ruins of a Garhi, Baoli
Sigon Syavan	Medieval sculptures and tank
	Temple *(c.* eighteenth century)

Site/Village	*nature of remains*
Thurat	Black-and-red ware, black-slipped ware, red ware, temple (c. eighteenth-nineteenth century) and tank
TikariaJaitpur	Red ware and iron slag

76. EXCAVATION AT AGIABIR, DISTRICT MIRZAPUR

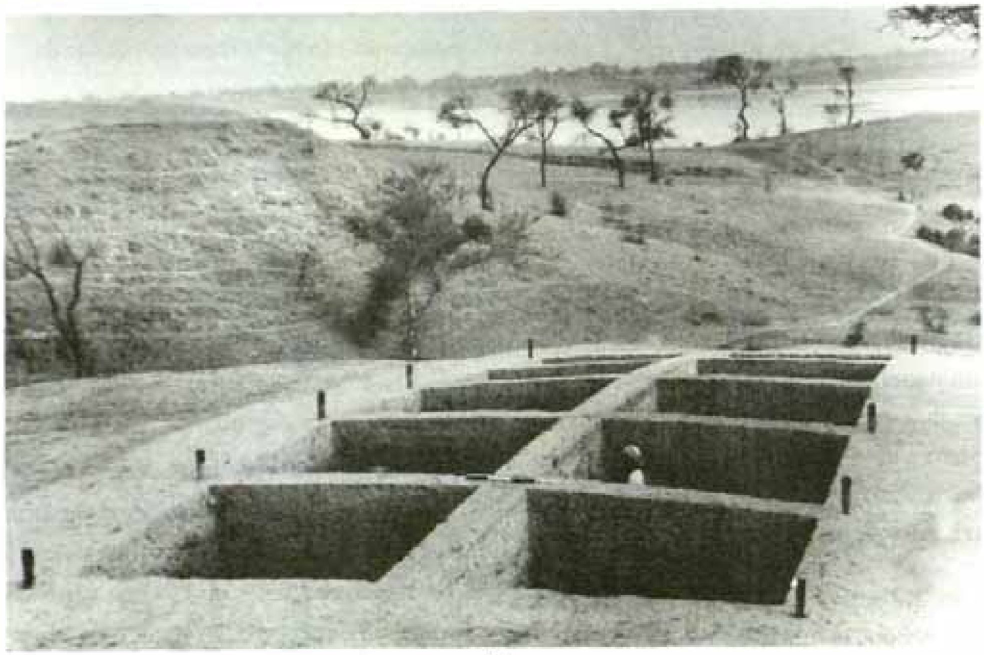
The Department of Ancient Indian History, Culture and Archaeology, Banaras Hindu University conducted excavations at Agiabir (25° 13' 52" N; 82° 38' 41" E) in District Mirzapur under the direction and co-ordination of Purushottam Singh and Ashok Kumar Singh, assisted by R.N. Singh, Santosh Kumar Singh, Sharawan Kumar, Laxmi Shankar Yadav, Jairam Singh, Ram Badan Ram, Barun Kumar Singh and Arun Kumar Pandey.

The ancient settlement is located on the left bank of the Ganga, about 2 km south-east of Katka railway station on Varanasi-Allahabad section of the Northern Railway, on the borders of Mirzapur and Ravidasnagar (Bhadohi) districts. Katka is situated 38 km west of Varanasi on the Varanasi-Allahabad G.T. Road. The ancient settlement extends in an area of more than a kilometre along the river and its has been partly eroded by it which is still nibbling it away. The main mound measures about 500 x 500 m. The excavation was carried out in the western part of the settlement (named ABR-1) as also in the eastern part of the main mound (termed ABR-2). On Mound-1 ten trenches, measuring 3 X 3 m square, were excavated (pl. 74), while on Mound-2 only one trench measuring 5 X 2 m area was excavated upto a depth of 7 m, without reaching the natural soil.

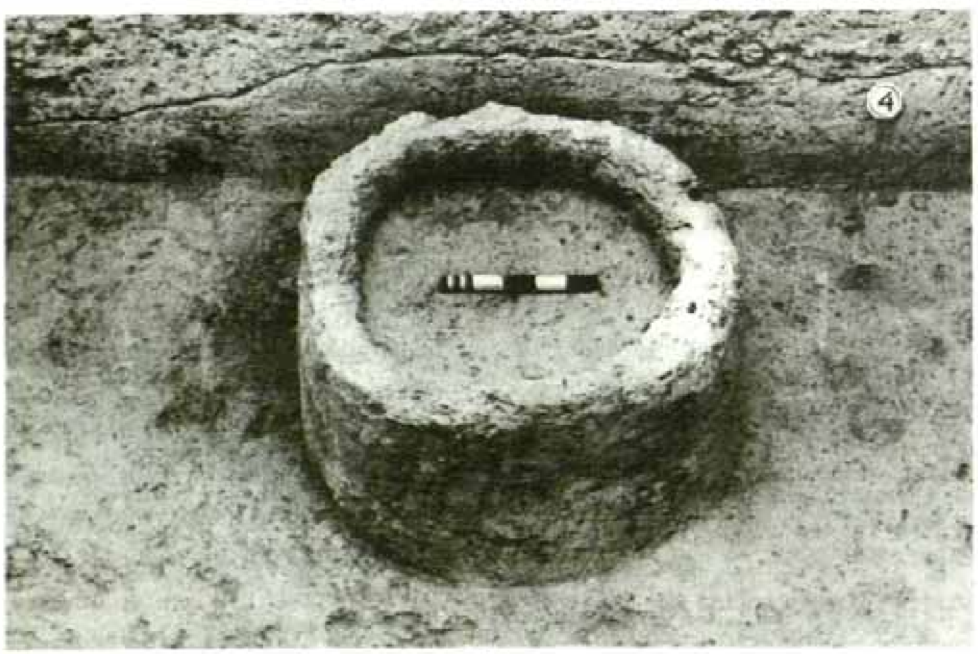
Remains of Narhan culture (Period I) were documented in the lowermost 60 cm cultural deposit. The main ceramic industries of this period comprised black-and-red ware (mostly medium and coarse fabrics), black-slipped ware (in limited quantity but in fine fabric) and red ware. A few sherds of black-and-red ware and black-slipped ware bear linear paintings in white as in case of Narhan. The main types in black-and-red ware are bowls, storage-jars, lipped-basins and dish-on-stand. A few sherds of black-and-red ware bear cord impression on the exterior. In black-slipped ware the important shapes are deep bowls, *lota-shaped* vessels and pedestalled bowls. In red ware no kitchen ware vessels were reported except that of legged-bowls with several perforations at the base. Vases and storage-jars, some bearing applique designs on the exterior, are the other types in this ware.

The inhabitants of this period lived in wattle-and-daub houses. Fragments of burnt-clay with reed marks and patches of floors, ovens and post-holes have been recorded. Two silos, obviously used for storage of grains, were recorded from this period (pl. 75). A bead manufacturing workshop is an important discovery of this period (pl. 76). Twenty-six stone beads (eithteen finished and eight unfinished) together with waste stone chips, indicating their local manufacture, were recovered. Other antiquities comprise eighteen net-sinkers, nine bone points and sixty-three pottery discs (including ten perforated specimens). An incense burner or lamp of baked clay is another noteworthy find of this period.

Plates 74-75



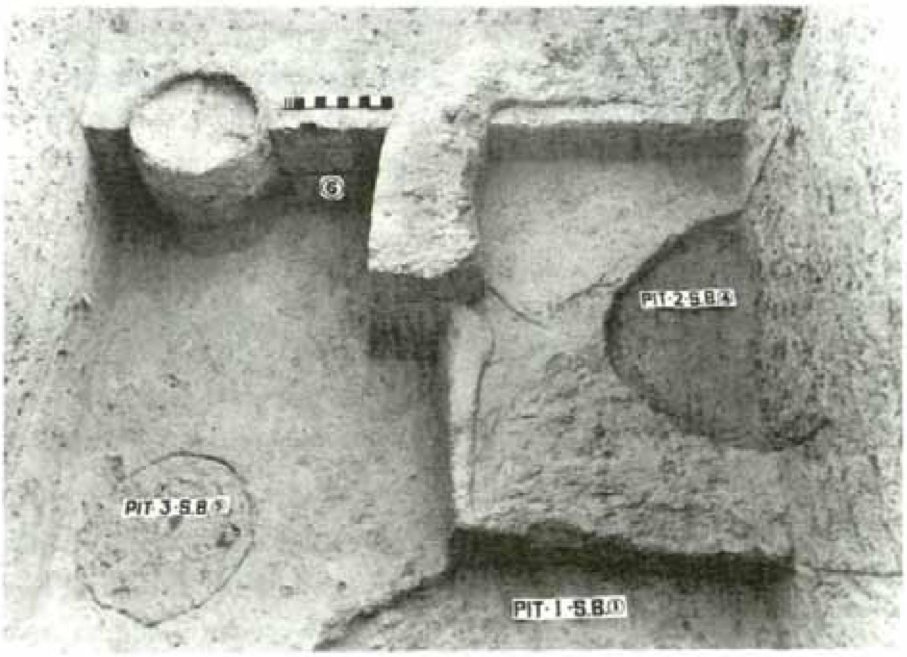
74



75

Agiabir : 74, view of excavated trenches, Mound 1 and 75, silo for storing grains

Plates 76-77



76



77

Agiabir : 76, bead manufacturing workshop, Period I and 77, rammed-floor, Period III

A large number of animal bones and four charcoal samples were collected from various strata of Period I. Their study will furnish valuable data about the fauna and chronology of this period.

The inhabitants of Period II lived in wattle-and-daub houses. Traces of burnt-floors, ovens, silos and post-holes have been recorded. This period is marked by the ceramic assemblage of black-slipped ware and red ware but with total absence of black-and-red ware. The main types in black-slipped ware are knife-edged bowls, dishes and pedestalled-bowls. In red ware dish, knife-edged bowl, tumbler with thick core,button-based goblet and vase are the principal types. The small finds comprise beads of semi-precious stone as well as terracotta; bone points, iron and copper objects and pottery discs.

Like the preceding period, the inhabitants of Period III lived in wattle-and-daub houses. Remains of post-holes, ovens, rammed-floors made of potsherds were noticed in this period (pl. 77). The main ceramic industries of this period are black slipped ware, NBPW (some of it of deluxe variety having steel blue, silvery, pink and golden shades), grey ware and red ware. Straight-sided and flanged bowls, dishes with incurved rim are the important types of the first three wares. In red ware, bowls, lipped-basins and vases are the main types. A dish with handle of NBPW bearing a thick slip is a new type in this ware.

The small finds comprise beads of terracotta and semiprecious stones (agate, carnelian, quartz and faience); bone points, terracotta balls, copper and iron objects and terracotta discs. Mention may be made of a large number of terracotta discs (two hundred and thirty-six in number) found in limited excavation. Among these, three terracotta discs bear running antelope motif incised on them. Similar specimens were recorded earlier from Rajghat and Prahladpur.

A hoard of about three hundred faience beads placed in miniature vessel of black-slipped ware is another noteworthy find. The discovery of a number of beads along with stone chips from this period indicates that these were produced locally.

One room measuring 2.98 X 2.20 m with walls made of burnt-bricks (46 X 26 X 5 cm) was found in the trench located on the eastern slope of the main mound. The northern and western corners of this structure were found to be robbed. Remains of Period IV comprised red ware as the principal ceramic industry with vase, ink-pot lid, sprinkler, pear-shaped vase (Ahichchhatra 10 A) and *ugged-karahi* as the main type.

The small finds comprise two copper coins, bone points, terracotta figurines, terracotta discs, antimony rods of copper and iron objects. A votive tank of terracotta is an important find of this period.

An ivory seal with four letters engraved in Brahmi characters of fourth century AD *(Satyanaga or Sandnaga)* was recovered from inside the room. A fragmentary terracotta nude female figurine with legs raised and spread apart is another noteworthy find. Similar figurines were reported earlier from Bhita, Kausambi and Jhusi. This indicates that the cult of

mother goddess was prevalent in the middle Ganga plain in the early centuries of Christian era.

The mound continued to be inhabited during the Gupta period as also in the post-Gupta tmes. However, the remains of these periods could not be documented in the limited excavation. Fragments of stone jambs of temples with *Krishna-lila* scenes carved on them and broken sculptures of Ambika, Ganesa, Surya and *Siva-linga* datable to tenth-twelfth centuries AD are lying on the present day temple of Lutabir located south-west of present Agiabir village.

77. Exploration in District Mirzapur

In continuation of the earlier work *{1997-98,* pp. 181-183), the State Archaeology Department, Government of Uttar Pradesh, resumed exploration in Chhanbe block in District Mirzapur. The exploration was conducted by Girish Chandra Singh, under the direction of Rakesh Tewari and Prahlad Kumar Singh. A number of sites comprising antiquarian remains, datable between pre-NBPW to medieval period, have come to light during the course of exploration. The ancient mounds of Gogaon, Naugaon, Nandini, Shivpur, Deori, Chaderu Chaukatha, etc., are important amongst them. Besides a group of miniature stone temple datable to *c.* tenth century AD., stone pillars bearing the depiction of *Ramayana* scene mom the village Bhau Singh-Ka-Pura/Ataraila, multi-handed image of late Kushan period from Parmanpur are also noteworthy.

A list of the explored sites with their cultural assemblage are as under.

Village/Site	*Nature of remains*
Akorhi	Red ware, black ware (Kushan to early medieval period); medieval Brahmanical sculptures; architectural remains and inscription inNagari script
Babura	Stone celt, medieval Brahmanical sculptures
BagheraKalan	Black-and-red ware, black-slipped ware, NBPW, grey ware (200 to 800 BC); stone celts, medieval Brahmanical sculptures
BagheraKhurd	Microliths, stone quarry, kolhus (late medieval), and architectural remains
Bagehera Tewari	Red ware (Sunga-Kushan period), architectural remains (eleventh century), inscription in Devanagari script, medieval Brahmanical sculptures
Bahuti Mai Chakchaura (Jagishpur/Parmanpur)	Black-and-red ware, black-slipped ware, grey ware, NBPW, red ware (c. 1000 BC to early medieval period); terracotta dabber, bead, animal figurines, stamp; stone blades and sculpture of Kushan period

Village/Site	*Nature of remains*
Bajtha	NBPW, red ware, black-slipped ware to Gupta period
Barai Bari	Medieval Brahmanical sculptures
Behasara	Red ware (post-Gupta), medieval Brahmanical sculptures
Bhau Singh Ka Pura/Ataraila	Black-slipped ware, NBPW, grey ware, red ware, (*c.* eighth century BC to late medieval period), medieval Brahmanical sculptures and obelisk
Bhilaura Bijaipur/Mulhana Ki	Medieval Brahmanical sculptures and stone kolhus
Pahari	Black ware, grey ware (Kushan to Gupta period), architectural remains, an inscription of early fifteenth century and megaliths
BijarKalan	Stone kolhus bearing Nagari inscription
Birohi	Red ware (Kushan to Gupta period), architectural remains of twelfth-thirteenth century and stone sculptures
Chaderu Chaukatha	Red ware, NBPW, medieval Brahmanical sculptures, grey ware, terracotta figurine of Kushan period, medieval Brahmanical sculptures and architectural remains
Charaincha	Red ware, black-and-red ware, black ware (medieval period)
Deori	NBPW, black-slipped ware, black ware, red ware, black-and red ware (sixth century BC to Gupta period)
Dugauli Gaura	Red ware, black ware (Gupta period), terracotta, medieval Brahmanical sculptures, stone kolhus
(Khas)	NBPW, black-slipped ware, black ware, red ware, black-and red ware, terracotta and glass bangles, medieval Brahmanical sculptures and architectural remains
Gogaon	Black-and-red ware, black-slipped ware, NBPW, grey ware, black ware, red ware (pre-NBPW to Gupta period), terracotta and medieval Brahmanical sculptures
Gopalpur Jansa	Red ware, black ware (Gupta period), terracotta objects
Beghaura	Medieval Brahmanical sculptures and architectural remains

Village/Site	*Nature of remains*
Jaunpa	Black-and-red ware, black ware, red ware (Kushan period), terracotta objects, group of miniature stone temples, sculptures of late Gupta and medieval period, obelisk
Jigna	Medieval Brahmanical sculptures and architectural remains, stone and kolhus, obelisk
Kami Bhanwan Kulahi	Red ware (Kushan to Gupta period)
Kusha	Black-and-red ware, black-slipped ware, grey ware, black ware, red ware (1000 to 200 BC)
Mahokhar	Red ware, black ware (historical to early medieval period) terracotta mould and stone kolhus.
Mankathi	Medieval Brahmanical sculptures and architectural remains
Nandini	Medieval Brahmanical sculptures
Naugaon	Black-slipped ware, NBPW, red ware, black ware and broken stone celt
Nigura Ban Singh	Black-and-red ware, black-slipped ware, grey ware, NBPW (sixth century BC to medieval period), miniature stone temple, medieval Brahmanical sculptures, stone kolhus
Parwa	Red ware, black ware (Kushan to Gupta period) and terracotta figurine
Saroi Babu	Votive tablet of Ganesa, medieval Brahmanical sculptures, obelisk (medieval)
Shivpur (Near Vindhyachal)	Medieval Brahmanical sculptures and architectural remains
Sikra Kalan	Black-slipped ware, black-and-red ware, grey ware, NBPW, red ware (c. sixth century BC to late medieval period), medieval Brahmanical sculptures and architectural remains belonging to seventh to twelfth century and obelisk
Sinduria (Gaharwar)	Red ware (Kushan period), architectural remains of twelfth century including Nagari inscription and brick structure
	Architectural remains datable to eighth-ninth century

Village/Site	Nature of remains
Supantha/Subantha	Architectural remains, inscriptions and votive stone temple of about twelfth century
Tilai	Medieval Brahmanical sculptures and architectural remains and obelisk (medieval)
TiKani	Stone temple remains and sculptures of medieval period
UnchDih	Obelisks (medieval)

78. EXPLORATION IN DISTRICT RAEBARELI

D.P. Tewari, assisted by Anoop Kumar Singh of the Department of Ancient Indian History, Culture and Archaeology, University of Lucknow, discovered the following sites of archaeological importance.

Tehsil	Village/Site/Block	Nature of remains
Lalganj	AmbaraPaschim (26° 07' 45" N; 80° 56' 40" E)	Red ware, broken sculpture, brick temple, Kushan to early medieval period
do	Bahai (26°07'45"N;81°0'E.)	Kushan to medieval
do	Baraundi (26°18'10"N;80°54'10"E)	Red ware, brickbats, medieval
do	Deogaon (26° 15' 80" N; 80° 54' 05" E)	Red ware, brickbats, Kushan to medieval period
do	Dhurai (26° 20' 10" N; 80° 55' E)	Red ware, brickbats, Gupta to medieval period
do	Khiron Bhiter Gaon	Red ware, brickbats, Gupta and early medieval period
do	Mathura Khera	Red ware, brick temple, Gupta to early medieval period
do	Pahrauli Ranapur (26° 19'N; 80° 54'E) .	Red ware, Gupta to early medieval period
do	Pahu (26° 20'N; 80° 55'E)	Red ware, terracotta figurines of Kushana period, brick temple and sculptures, Kushan and early medieval period

Tehsil	*Village/Site/Block*	*Nature of remains*
Maharaj Ganj	Janai (26° 26'45" N; 81° 21'45" E)	Brick temple and stone sculptures, ninth-tenth century
do	Jauna (26° 23'15" N; 81° 20'20" E)	Red ware and brick temple with stone sculptures, Gupta to early medieval period
do	Kundanganj (26° 23'35" N; 81° 08'15" E)	Two brick temples of seventeenth century
do	Mon (26°24'25"N;81°18'25"E)	Red ware, grey ware and brick temple
do	Pithan (26° 24' 38" N; 81° 08' 40" E)	NBPW, black-slipped ware, red ware, terracotta male head of Kushan period, brickbats, remains of structure, unlined wells and sculptures, datable from NBPW to medieval period
do	Thulendi (26°27'N;81°10'E)	Red ware, brickbats, ruined mud wall and structures, Gupta to medieval period
Raibareli	AiaspurDih(Rahi) (26°1l'N;81°19'40"E)	NBPW, black-slipped ware, grey ware, black-and-red ware, red ware, brickbats, NBPW to early medieval
do	Bans(Sataun) (26° 12'20-25" N; 81° 11'35" E)	Red ware, brick (size 48 X 24 X 8 $^{1}/_{2}$ cm), Kushan and medieval
do	Bhawaninagar(Harchandpur) (26° 20'25" N; 81° 66'45" E)	Brick temple and broken sculptures
do	Dighia(Rahi) 26° 15'N; 81° 20'E	Red ware, early medieval and medieval remains
do	Dih(Awawan) 26° 19'35" N; 81° 20'05" E	Red ware, black-and-red ware, black-slipped ware, brickbats, 300 BC to medieval period
do	GangaGanj(Harchandpur) 26° 17'N; 81° 12E	Red ware, iron slags, brickbats, remains of two minars, Kushan to medieval
do	GauraDih(Amawan) 26° 18'55" N; 81° 23'25" E	Red ware of early medieval period to medieval period

Tehsil	*Village/Site/Block*	Nature of *remains*
Raibareli	Johwa Hisar Kotwa (Harchandpur) 26° 23' 35-45" N; 81° 05' 35-45" E	Red ware, massive brickbats, remains of structure, Kushan sculpture and terracotta figurines
do	Kanshamira 26° 28'N; 81° 10'E	Grey ware, black-slipped ware, red ware, brickbats datable from 700 BC to medieval period
do	Kathwara (Harchandpur) 26° 19'20" N; 81° 10'55" E	Red ware, glazed ware, brickbats of early medieval to medieval period
do	Khaspari (Amawan) 26° 18'15" N; 81° 28'45" E	Red ware, brickbats of medieval period
do	Kotesar(Malikmau) 26° 10'45" N; 81° 02'40" E	Brick temple, broken sculpture of early medieval period
do	Koteshar Mahadeva (Sataun) 26° 16' 50-60" N; 81° 02' 40-45" E	NBPW, red ware, glazed ware, ruined structure, broken sculpture of early historical to medieval period
do	Mohaliya(Rahi) 26° 05'50" N; 81° 16'05"E	Red ware, ruins of structure, brickbats, Gupta to medieval period
do	Munai (Rahi) 26° 10'55" N; 81° 20'40" E	Red ware, brick stupa, ruined structure, brickbats, Gupta to medieval period
do	Raibareli 26° 14'N;81° 14'E	Monuments of sixteenth to eithteenth century
do	Rahi (Rahi) 26° 14,25"N; 81°18'40"E	Red ware and brickbats, Kushan to medieval
do	Rasulpur (Amawan) 26° 17 55" N; 81° 25'50" E	Red ware, brickbats, Kushan to medieval
do	Sandiram (Amawan) 26° 15'50" N; 81° 20'15" E	NBPW, black-slipped ware, grey ware, red ware, black-and-red ware, glazed ware, terracotta animal figurine, hopscoches, pre-NBPW to medieval
do	Sataun (Sataun) 26° 17 50" N; 81° 02'50" E	Stone sculptures of Parvati, Ganesa, Vishnu of ninth-tenth century

Tehsil	Village/Site/Block	Nature of remains
Raibareli	Uttarpara 26° 07' 22-36" N; 81° 16'-012" E	NBPW, black-slipped ware, black-and-red ware, red ware and glazed ware, massive brickbats, sprinkler, skin-rubber, stone sculptures, NBPW to medieval period
Salon	Ahora Rampur (Parshadepur) 26°05'05"N; 81°30'25"E	Red ware, glazed ware, mullar, inkpot-type lid and brick, Sunga to medieval
do	Atawan(Dih) 26° 06'50" n; 81° 29'10" e	Black-slipped ware, grey ware, black-and-red ware, red ware and brickbats, Sunga to medieval period
do	Bire(Dih) 26°07'20"N; 81° 28'45"E	Red ware, brickbats, medieval
do	Dayalpur(Dih) 26° 09' 50" N; 81° 24' 10" E	Red ware, brickbats, early medieval period to medieval
do	Dih(Dih) 26° 08'25" N; 81° 24'50" E	Red ware, brickbats, early medieval period to medieval
do	Durgapur(Dih) 26° 10' 10" N; 81° 25' 45" E	Black-and-red ware, black-slipped ware, NBPW, grey ware and red ware, with brickbats, pre NBPW to medieval
do	Jagdishpur (Salon) 26° 06' 40-50" N; 81° 26' 20-35" E	Red ware and brickbats, early medieval to medieval period
do	Kaushalpur (Salon) 26° 40'N; 81° 23'55" E	Red ware and brickbats, sculpture, early medieval to medieval period
do	Kharchni Pahargarh (Salon) 25° 01'55" N; 81° 20'35" E	Red ware, brickbats, Siva temple with Siva-*linga*, *nandi,* Ganesa, Parvati (marble), early medieval to medieval period
do	Kithawan (Salon) 26° 59'38-40" N; 81° 29'25" E	Black-and-red ware, black-slipped ware, NBPW-pre NBPW, grey ware, glazed ware, brickbats, medieval brick (size-23 X 15 X 4.5 cm), skin rubber, button-knobbed hopscotches, spout, pre-NBPW to medieval
do	Mamni (Salon) 26° 10'N; 81° 25'10" E	Red ware, medieval period

Tehsil	*Village/Site/Block*	*Nature of remains*
Salon	Matka (Salon) 26° 01' 45" N; 81° 25' 15" E	Red ware, medieval period
do	Mau(Dih) 26°ir55"N;81°26'50"E	Red ware
do	Mohanganj (Salon) 25° 59'52" N; 81° 28'45" E	Red ware and brickbats, early medieval to medieval period
do	Nigohi(Dih) 26° 09'40" N; 81° 22'40" E	Red ware and brickbats, early medieval to medieval period
do	P. Madho Singh (Dih) 26° 10'30" N; 81° 27'10" E	Red ware and brickbats, early medieval to medieval period
do	P.Rudra(Salon) 26° 01'50" N; 81° 24'45" E	Black-slipped ware, grey ware, red ware, glazed ware, brickbats, broken part of door-jamb
do	Rasidpur(Dih) 26° 06'55" N; 81° 28'35" E	Red ware and brickbats, medieval period
Tikri	AkbarpurPharsi 26° 25'25" N; 81° 24'20" E	Black-slipped ware, red ware, broken sculpture of females in *tribhanga mudra* and a pot containing ten female figures, a brick temple dedicated to *Siva-linga*
do	Alampur(Bahadurpur) 26° 15'25" N; 81° 31'E	Brick temple of Siva with *Siva-linga, nandi* and Ganesa
do	Bar Kot 26° 19'55" N; 81° 20'28" E	A *lakhauri* brick temple of Siva with *Siva-linga, nandi,* Ganesh, Sarasvati, Lakshmi- Vishnu, Arjuna-Krishna
do	Chaura (Mohanganj) 26° 18'N; 81° 25'E	Red ware, black-slipped ware, brickbats
do	Deo Kali 26° 23'30" N; 81° 27'45" E	Red ware, brick temple dedicated to Siva with Siva-*linga*, Nandi, Durga, Kali and Hanuman
do	Faridpurparwar(Bahadurpur) 26° 16'50" N; 81° 28'20" E	Sculptures of Vishnu, Karttikeya, Pratiharis, part of door-jamb, brickbats
do	Gonde 26° 17'20" N; 81° 25'35" E	Red ware, brickbats, medieval period

Tehsil	*Village/Site/Block*	*Nature of remains*
Salon	Jais(Jais) 26° 15' N; 81° 32'E	Red ware, glazed ware, mosque of *lakhauri* bricks, tomb of Sadali, medieval period
do	Khataha 26° 16' N; 81° 25'40" E	Red ware and grey ware, button-knobbed lids, skin rubbers, brickbats, Sunga to medieval period
Tikri	Kura (Mohanganj) 26° 19'45" N; 81° 30'15" E	NBPW, black-slipped ware, grey ware, black-and-red ware, red ware, skin rubber, button-knobbed lids, terracotta balls, brickbats
do	Lihi(Tiloi) 26°21'10"N;81°3r55"E	Red ware, glazed ware, button-knobbed lids, brick bats, Kushan to medieval period
do	On Dih (Mohanganj) 26° 19'40" N; 81° 24' 10" E	Red ware, brickbats, medieval period
do	Pidhi(Tiloi) 26° 10' 55" N; 81° 25' 55" E	Red ware, button-knobbed lids, unlined wells of *lakhauri* bricks, Kushan to medieval period
do	PurePathan(Tiloi) 26° 13'10" N; 81° 26'15" E	Red ware, skin rubber, brickbats, Kushan to medieval period
do	Pure Shiva (Bahadurpur) 26°15'45"N;81°26'20"E	Red ware, brickbats, early medieval to medieval period
do	Reotidih(Tiloi) 26° 23'10" n; 81° 25'15" E	Red ware, glazed ware, brickbats, a stone sculpture of standing female holding an object in her joint hand, early medieval to medieval period
do	Sarai Mahesha (Bahadurpur) 26°23'50"N; 81°33'25"E	Red ware, glazed ware, skin rubber, spouted vessels and ruins of structures, Kushan to medieval period
do	Singana(Tiloi) 26° 18'15" N; 81° 28'10" E	Red ware, medieval period
do	Tamamau(Tiloi) 26° 18'50" N; 81° 33'20" E	Two brick temples (Siva) and *lakhauri* bricks
do	Tinera(Tiloi) 26° 14' 05" N; 81° 26' 40" E	Red ware, glazed ware, skin rubber, spouted vessels and brickbats, Kushan to early medieval period

Tehsil	*Village/Site/Block*	*Nature of remains*
Unchahar	Aihari Bujurga (Rohnia) 25° 59'05" N; 81° 19'50-59" E	Red ware, brickbats, broken stone sculptures of Ganesa Hanuman, Vishnu, early medieval to medieval period
do	ChakBhira (Rohnia) 25° 54' 15-25" N; 81° 19' 05-10" E	Red ware, brickbats and a part of door-jamb, Ganga or Yamuna, early medieval to medieval period
do	Chandria (Rohnia) 25° 59'35" N; 81° 17'E	Red ware, ruins of structures, brickbats
do	Dharai (Rohnia) 25° 57 45" N; 81° 28'20" E	Red ware, brickbats
do	Godhwan Hasanpur (Rohnia) 25° 59'20" N; 81° 22'10" E	Red ware, brickbats, early medieval to medieval period
do	ItauraBuzarga (Unchahar) 25° 33'25" N; 81° 14'50" E	Black-slipped ware, black-and-red ware, red ware, glazed ware, brickbats and stone sculpture, datable from Sunga to medieval period
do	Mirgahanpur (Rohnia) 25° 55'50" N; 81° 26'55" E	Red ware, brickbats, early medieval to medieval period
do	Mirzapur Aihari (Rohnia) 25° 58'20" N; 81° 20'05" E	Red ware, brickbats, ruins of structure, brick temple with *Siva-linga,* Parvati, Ganesa, *nandi,* Karttikeya and Hanuman, *lakhauri* bricks, part of door-jamb, early medieval to medieval period
do	Muhammadpur Chandan (Unchahar) 25° 52'25" N; 81° 17 50"E	Red ware, skin rubber and brickbats, Gupta to medieval period
do	NaidauraMauji (Rohnia) 25° 57 N; 81° 24'E	Red ware, black-slipped ware, black-and-red ware, Kushan, Gupta bricks, skin rubber, mullar, Sunga to medieval period
do	Pitthapatti (Rohnia) 25° 59-05'15" N; 81° 23'E	Red ware, brickbats, iron slag, bricks (19x 13.5x4 cm) (used in well), early medieval to medieval period
do	Pure Barsawan (Unchahar) 25° 52' 40" N; 81° 16' 05" E	Red ware, brickbats, medieval period
do	Pure Durga Bakhsh (Unchahar) 25° 54' 40-50" N; 81° 15' 42-55" E	Red ware, glazed ware, skin rubber, brickbats, Gupta to medieval period

Tehsil	*Village/Site/Block*	*Nature of remains*
Unchahar	PureDurgaGulab(Unchahar) 25° 54' 05" N; 81° 15' 25" E	Red ware, brickbats, medieval period
do	Pure jet (Unchahar)	Red ware, skin rubber, button-knobbed lids, brickbats, Kushan to medieval period
do	Rasulpur(Rohnia) 25° 56' 15" N; 81° 26'10" E	Red ware, black-slipped ware, black-and-red ware and glazed ware, brickbats, iron slag, skin rubber
do	Rohnia 25° 58'45" N; 81° 23'E	Red ware, brickbats, stone sculpture, part of door-jamb
do	Sabaiya Hasan (Unchahara) 25° 56'45" N; 81° 17 30" E	Red ware, black-slipped ware, black-and-red ware, Kushan bricks
do	SalimpurBhairwar (Rohnia) 25° 55' 20-30" N; 81° 25 30-35" E	Red ware, brickbats, ruins of structure, skin rubber, Gupta to medieval peirod
do	SaraiAkhtiar (Rohnia) 25° 55'35" N; 81° 24'45" E	Red ware
do	Unran (Unchahar) 25° 56'30" N; 81° 21'55" E	Red ware, brickbats
do	Usraina (Rohnia) 25° 57'N; 81° 24'E	Red ware, glass, iron slag, inkpot-type lid, brickbats, ruins of structure

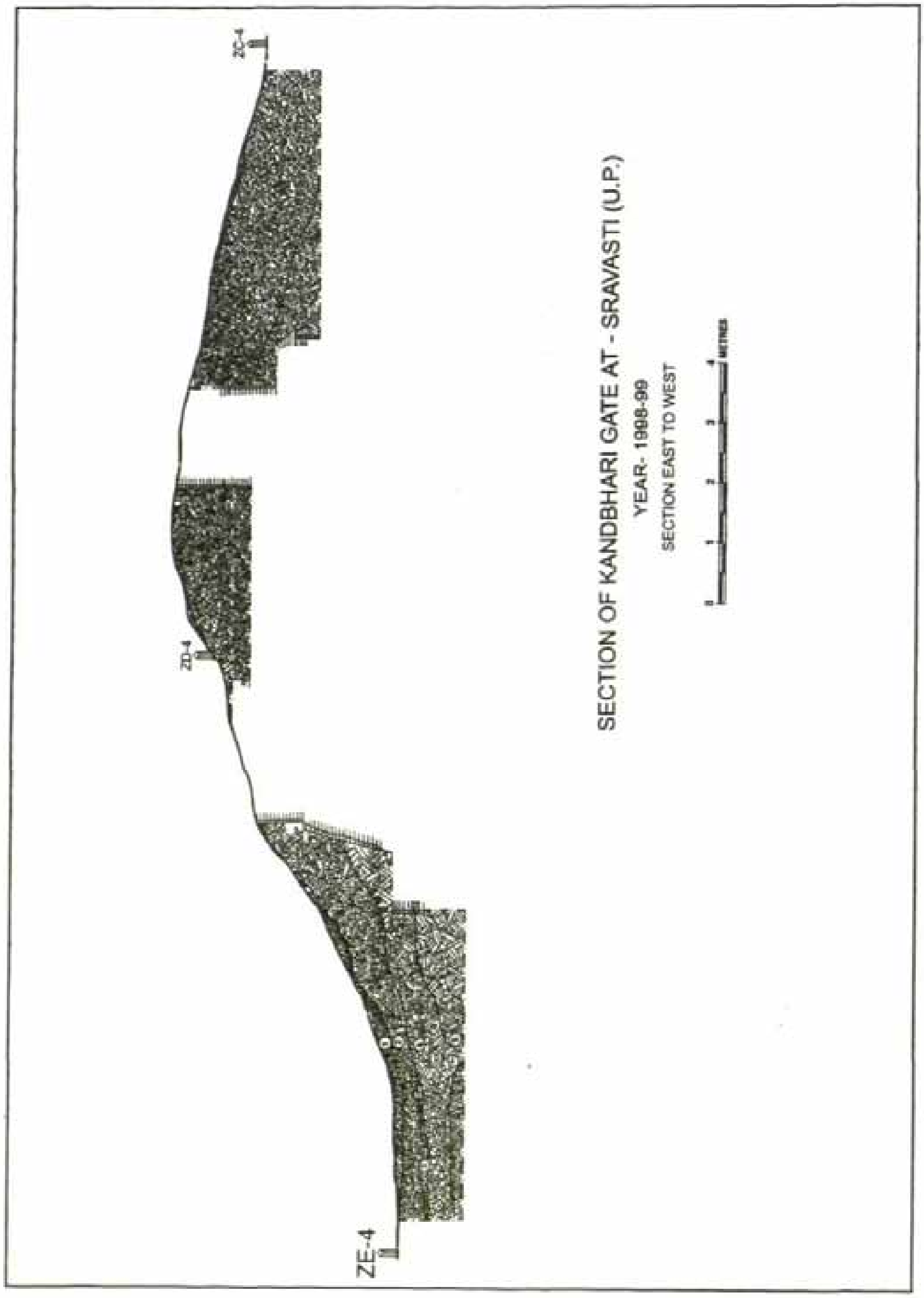
79. Exploration in District Pithoragarh

In continuation of the village-to-village exploration in tehsil Didihat, in District Pithoragarh (*1997-98,* pp. 183-184), about one hundred and twenty-nine villages and their hamlets were surveyed by the Regional Archaeological Unit, Almora, under the direction of Rakesh Tewari. Medieval stone sculptures of gods and goddesses were found in eight villages named Darati, Simar, Saugaon, Penoli, Sadgarh, Lezimkanda, Marthi Biniye and Gadali.

80. Excavation at Sravasti, District Sravasti

In continuation of the previous year's (*1997-98,* pp. 186-197) work, Excavation Branch III, Patna, of the Survey, in collaboration with the Archaeological Research Institute of Kansai University, Osaka, Japan conducted excavation at Sravasti. The excavation was carried out at Kandbhari Gate (fig. 33) under the joint direction of G.T. Shendey of the Survey and Takahiro Takahasi of Kansai University, assisted by D.K. Ambastha, D.K. Singh, N.K. Sinha, J.K. Tiwari, S.P. Gupta and O.P. Pandey of the Excavation

Fig. 33


SECTION OF KANDBHARI GATE AT - SRAVASTI (U.P.)
YEAR- 1998-99
SECTION EAST TO WEST
ZE-4
ZD-4
ZC-4
0
1
2
3
4
METRES

Branch III, Patna and F. Yoneda and others of the Japanese team. The purpose of excavation was to ascertain the architectural pattern of gateway and to expose other structural activities near the gate-complex.

Total fifteen trenches were excavated fully and partly resulting in the discovery of massive enclosure wall (pi.78), three security points and complete entrance-complex leading towards the fortified city ofMaheth.

Western enclosure brick wall (pl.79), running towards the bastion was noticed with 11.25 m length and 1.55m width. It continued upto layer 4 having a height of 2.16 m and maximum thirty-eight courses. This enclosure wall then turns east-west direction and are noticed in the Trenches F1,E1,D1,C1, ZC1, with 26.40 m length and 2.35 m width, upto eleven courses at the end of enclosure wall a small bastion measuring 5.25 m X 3.30 m X 1.3 m (twenty-four courses) were exposed. Thus the total length of western enclosure wall exposed is about 80 m. Small security cells 1.18 mx 1.25 m, 2 m X 1.25 m, 1.55 m X 1.25 m, 1.1 m X 1.25 m, 0.8 m X 2.15 m, 1.8mx 2.15 m were also exposed, which are linked with western enclosure wall on northeastern side. Remains of wall portion which was disturbed either by earthquake or flood was noticed at Trench E1 with a measurement of 8.95 m X 1.28 m X 1.35 m and forty-eight courses. A platform 4.2 m X 1.15 m X 0.18 m linking with this disturbed wall also found in Trench E1. Remains of brick paved footpath with 13.3 m X 2.3 m was found in Trench ZB2 and ZB3 which joined the bastion to bastion on the fortification.

Western part of the entrance mainly consists of a watch tower of thirty-three courses of bricks (pls.80-81) and a platform adjoined with watchtower on western side. The watchtower measures 14.4 m X 8 m X1.98 m. A platform which is adjoined with watch tower has the dimension of 11.4 m X 2.4 m X 1.32 m. This platform links watchtower to footpath. Along with the watchtower a security cell measuring 8.05 m X 4.3 m X 2.3 m was also exposed.

Eastern mound was taken up for operation to find out the gate-complex including its security points as it was noticed in the western mound with three tier system. Three Trenches ZE4, SE5 and ZE6 were taken up to expose the eastern wing of this gate.

A wall was noticed running south-to-north in the Qd 1 and Qd 4 of the Trenches ZE 4 and ZE 5 respectively. This wall is measuring 12 m with its maximum and minimum courses of bricks nineteen and seven respectively. Its maximum and minimum heights are 1.25 m and 0.45 m and the width is 2.5 m. Another wall was also found running west-to-east in the Trenches ZE 4, Qd 3 with its maximum height 1.35 m and the minimum height 0.4 m.

In the second tier of the security system on this mound, a running wall was found in Trenches ZE4, ZE5andZE6.

A brick wall was encountered running south-to-north having 18.90 m in length with its maximum and minimum height 2.65 m and 0.65 m respectively, with maximum of thirty-seven courses of bricks.

In-between the first and second tier, a brick paved platform was encountered in the Trench ZE 4 measuring 5.85 m X 2.60 m. A wall was found running west-to-east in the Qd 4 of Trench ZE 5 having its maximum and minimum courses of bricks twenty-five and six respectively. This running wall (measuring 3.70 m X 1.25 m) has a maximum height of 1.55 m.

Plates 78-79



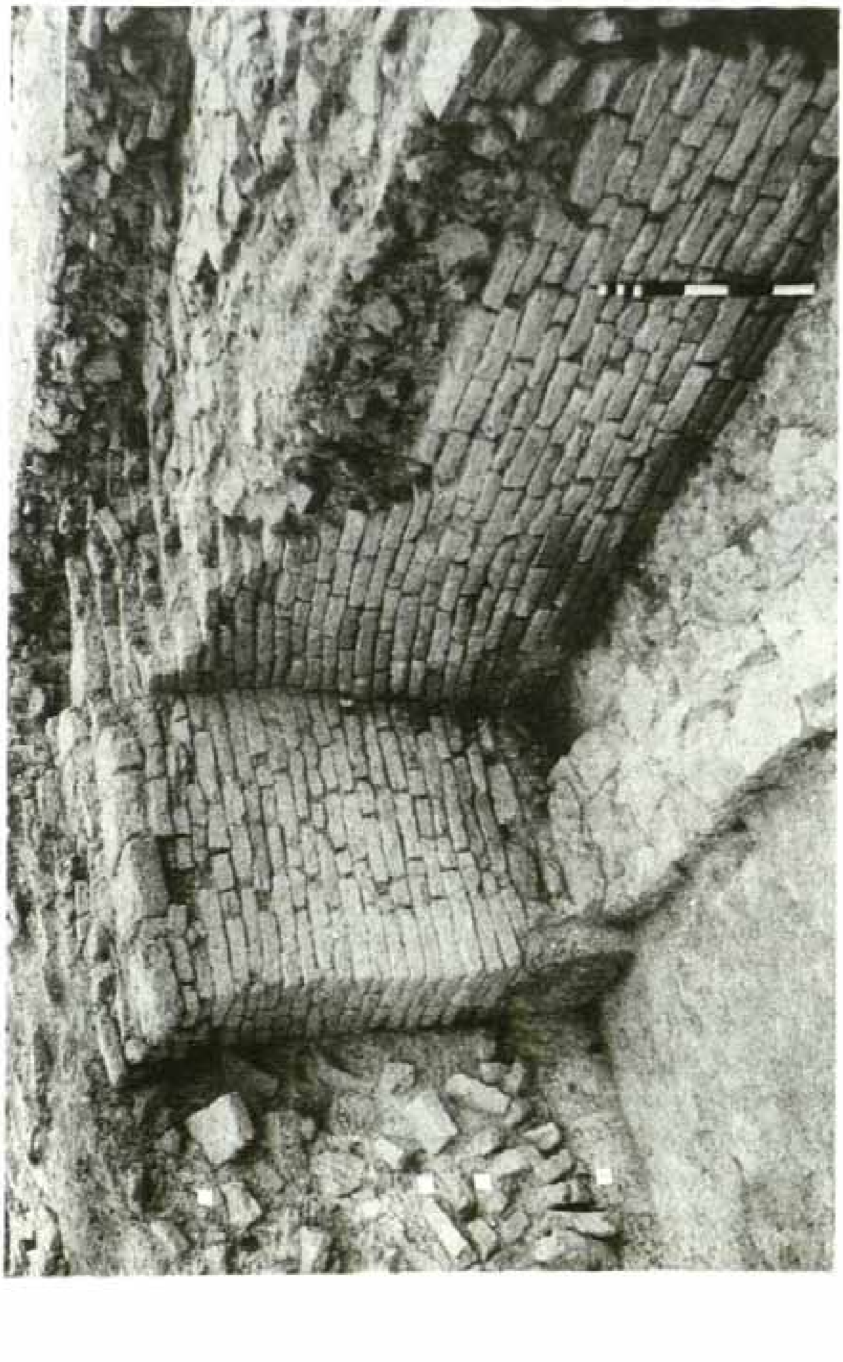
78



79

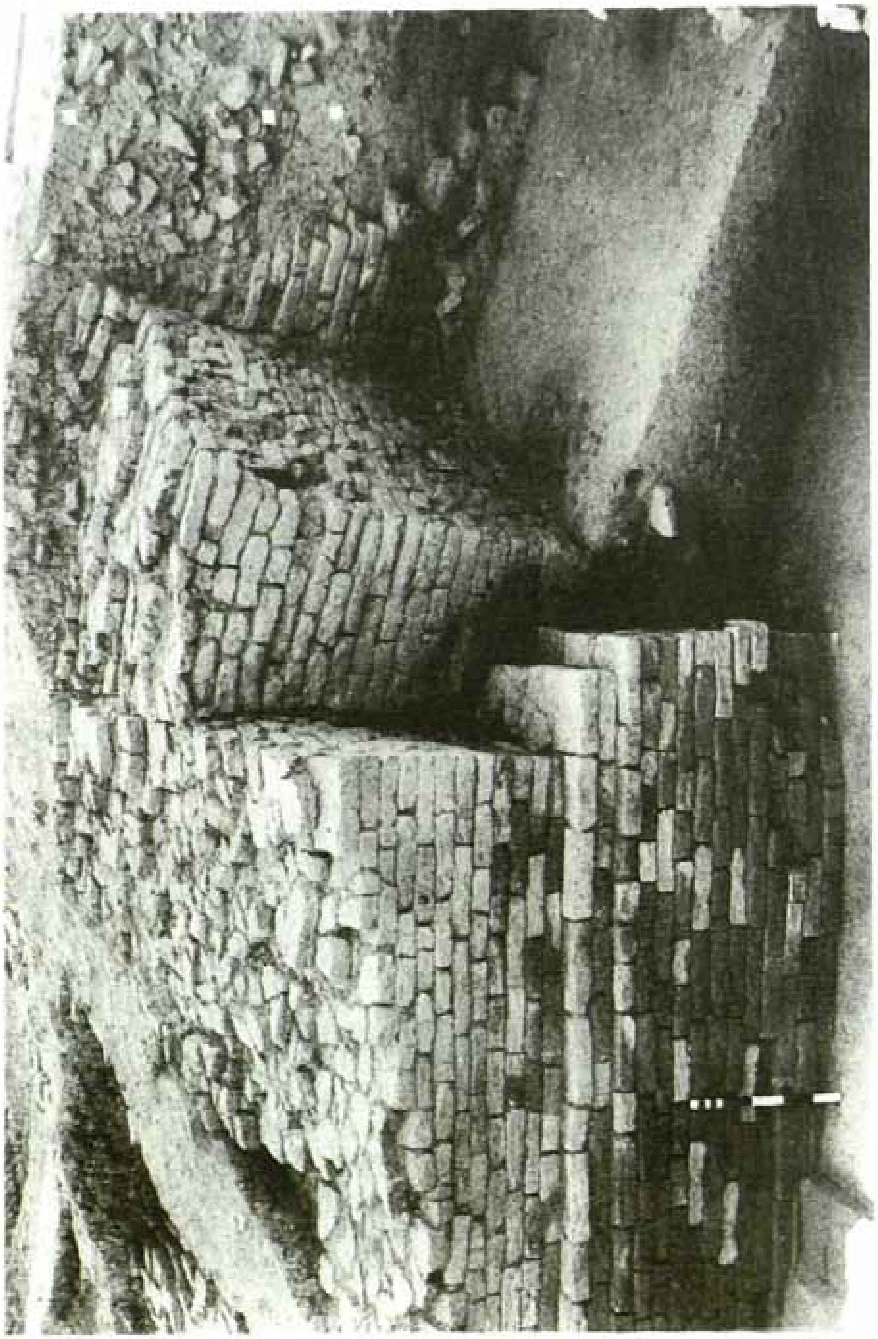
Sravasti : 78, two phases of massive enclosure wall and 79, view of western enclosure wall

Plate 80



Sravasti : view of enclosure wall and remains of watch tower

Plate 81



Sravasti : close view of intermediate security point

A cell measuring 4.40 m X 2.15 m was found in-between security cells of first and second tier.

The main gate-complex is built in terrace form. The floor of terraces are brick paved and probably used as platform/watchtower for security guards. The terraces are built at different heights from the street level. The complex is built of thick walls with a width of 1.18 m, the main entrance door has 6 m width.

Three phases of masonry activities are noticed in the complex. The earliest phase is marked by the construction of mud-walls. The second phase witnessed the construction of brick work on the low height mud-wall. The third phase is marked by the huge brick masonry work directly on the remains of second phase.

The street is also maintained accordingly. The earliest phase correspond with *kachcha* street while the other two phases correspond with brickbat paved street. The remains of socket hole of door-jamb is also noticed at the main gate-complex, where cut bricks are used to accommodate the shaft of the gate.

Fragments of terracotta tiles and finial also suggest that the roof portion was covered with tiles and finials. Iron nails, clamps and socket were also found in ZC4. Recovery of iron nails, clamps, socket etc., suggest that wooden members were used in superstructure. Middle security point was also roofed by terracotta tiles but not capped with terracotta finials. Location of two post-holes, cut in brick platform also suggest that wooden post would have been used in superstructure.

Other antiquities comprised iron arrow-heads, spear-heads, bell, nails, clamps, socket, knives and razor. Of the copper objects, coins, antimony rods, etc. were found. Points and stylus made of bone found during excavation throw revealing lights on the socio-cultural life of the people. Among the terracotta objects unearthed, important ones are inscribed with sealings, pictographic sealings, sealings with symbol, inscriptions, bead, hopscotch, skin rubber, wheel of toycart, fragments of human and animal figurine (pis. 82-85). Mention may be made of one terracotta sealing with inscription of *'Sivadevasa'* in Kushan Brahmi characters which is a notable find besides a crowned terracotta head of Kushan period.

On the basis of antiquities and pottery, the cultural sequence of this area can be divided into three periods:-

Period I	*circa* first century BC to third century AD
Period II	*circa* fourth century to seventh century AD
Period III	*circa* tenth century to twelfth century AD

81. Exploration in Districts Uttarkashi and Dehradun

The Regional Archaeological Hill Unit, Pauri Garhwal, Government of Uttar Pradesh, undertook second phase of exploration work in middle Tons Valley of Districts Uttarkashi and Dehradun, under the direction of Rakesh Tewari of the Department of Archaeology, Government of Uttar Pradesh, assisted by B.P. Badoni, B.B.S. Rawat and R.S. Kailkhuri.

During the village-to-village exploration, the team

Plates 82-83



82



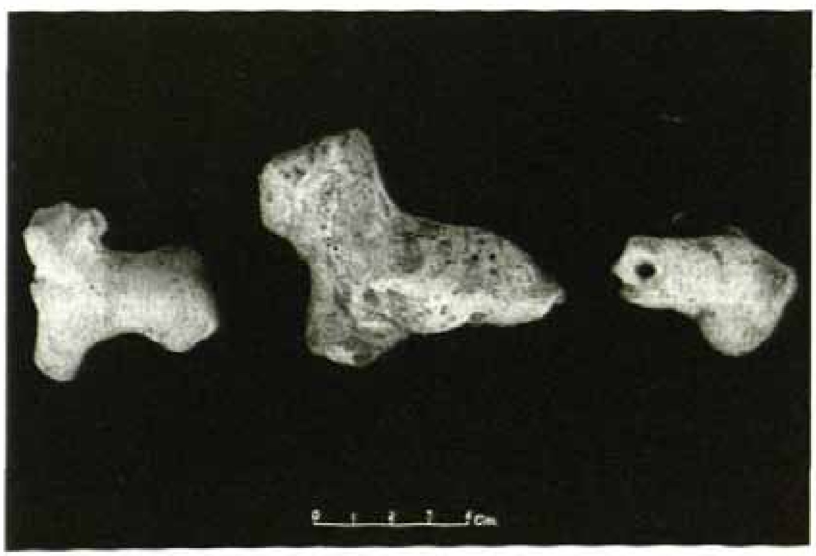
83

Sravasti : 82, Kushan terracotta sealing reads sivadevasa and 83, inscribed Kushan terracotta sealing

Plates 84-85



84



85

Sravasti : 84, *terracotta human figurines;* 85, *terracotta animal figurines*

discovered a number of temples belonging to the deities such as Mahasu, Pawasi and *Kaunl* Devta. Though these wooden temples have no earlier evidence but the tradition of temple building is still being followed. This practice is quite significant. e

The remains of medieval temple and sculptures also came to notice from two villages.

The sites with their cultural remains are listed below:

Tehsil	*Site/Villag*	
Chakarata	Bagi	Remains of wooden temple
-do-	Maindrath	Temple remains of later medieval period
Purola	Bainol	Remains of wooden temple
-do-	Bamsu	Excellent wooden temple of Mahasu and remains of medieval temple
-do-	Bingsari	Remains of five medieval temples with sculpture of Uma-Mahesa and wooden temple of Vishvasen-the so called son of Kama
-do-	Devban	Remains of wooden temple of Mahasu
- do -	Devjani	Wooden temple having *chhattravali* and *kalasa*
-do-	Devti	Peculiar wooden temple of Pawasi
-do-	Dobhal gaon	Small temple of Mahasu
-do-	Jevanu	Wooden temple of Khandasvari
-do-	Kharsari	Small temple of Mahasu
-do-	Khermi	Small temple built of wood
- do-	Motar	Two simple wooden temples of Mahasu and Kaunl devta
do-	Odata	Small wooden temple of Mahasu
-do-	Ramalgaon	Wooden temple of Vishvasena
- do -	Salara	Stone and wooden temple, highly decorated

82. EXCAVATION AT SUPANA, DISTRICT TEHRI

The Department of Ancient Indian History, Culture and Archaeology, HNB Garhwal University, Srinagar (Garhwal), carried out exploration and trial-excavation at Supana, under the direction of B.M. Khanduri, assisted by Vinod Nautiyal, R.C. Bhatt, Pradeep Saklani, Y.S. Farswan, K.S. Negi, J.S. Rawat, J.S. Negi, SudhirNautiyal and Khilaph Singh.

Besides imparting field training to the M.A. students of the University, the main objective of the work was to ascertain the antiquity of the region because of the fact that two earlier excavated sites Thapli and Ranihat in the same valley had given the evidence of PGW and early historical cultures respectively.

The exploration and a trial-excavation of the area discovered a single phase culture of post-Kushan period with the evidence of stone structure, iron implements, copper and silver objects, terracotta objects, pottery, beads, grinding stone and pestles.

The pottery from this period of Supana is plain and has no paintings at all. There are however, a few simple incised and stamped designs, notches, floral and leaf designs, mat and thumb impressions commonly found on vases, storage-jars and basins. The most common pottery from Supana is the red ware. The entire red ware is wheel-made and ranges from medium-to-fine texture. This red ware has various shapes like incurved bowls, miniature bolws, lamps, spouted-pots and lids, along with a perforated ware.

So far as the material culture of the people of this period is concerned, the art of smelting iron and copper was familiar to them. The people of Supana specialized themselves in the smelting of iron from the locally available ore and manufactured tools for their needs. Iron objects from the excavation numbered fifty besides some slag pieces. These included nails, arrow-head, borers, needles, rings, fish-hooks, blades, hooks and a fork. The occurrence of a large number of iron implements and fish-hooks from the excavation indicate that hunting and fishing were the two main sources of subsistence for the people of the Supana.

The excavation yielded copper and silver objects, terracotta objects, beads and animal remains. Due to it being a trial-excavation, the number of antiquities discovered are only a few. These include copper bangles, rings, antimony rods, plum bob or toy, silver bangles, carnelian and faience beads and a bead of Rudraksha. The excavation also yielded a few terracotta objects comprising rams, bulls, humped bulls, ear-rings, spinning-wheels, cart-wheels, crucible, hopscotch and stone ball. It is interesting to note that one of the terracotta figurines of an animal is decorated with *svastika* and *Indradhvaja* symbols. Apart from these, grinding stone and pestles were also discovered from the excavation.

A large number of remains of animal bone from this period indicate that meat was probably a principal diet of the inhabitants of Supana. The faunal remains in the form of limb, ribs, teeth, skull, pelvic, jaw, vertebrate and the bones of thoracic region, etc., suggests that animals like cattle, pigs, goats were domesticated during this period. The occurrence of a large number of charred and uncharred bones from this level proved that these domesticated animals were butchered for fulfilling their food requirements. The remains of vertibrae offish indicate that it formed a major diet item of the inhabitants of Supana.

83. Excavation at Choukhandi Stupa, Sarnath, District Varanasi

In continuation of the last season's *(1997-98,* p. 199) work, the Patna Circle of the Survey, carried out excavation on the eastern side of Choukhandi Stupa under the guidance of Muhammed K.K., assisted by A.K. Bandopadhyay, S.K. Sharma, Ajai Kumar, and Rajnish Kumar Raj with a view to exposing the lower portion of the structure. The excavation revealed some two meter wide pathway,

paved with bricks, leading to the centre, indicating that this stupa had atleast one gateway towards east. Traces *of a. pradakshinapatha* was also noticed at this level on the south-east corner of the stupa.

WEST BENGAL

84. EXPLORATION IN DISTRICT BIRBHUM

In the course of his field-work, Subrata Chakrabarti of the Depatment of Ancient Indian History, Culture and Archaeology, Visva-Bharati, Shantiniketan, discovered a new Acheulian locality, designated as Maluti Sadar Ghat, on the right bank of the rivulet Chila at about 24°7'N and 87 40' E in north-west Birbhum. The Chila here has developed two terraces, occurring at a height of 5 m and 12 m from its present bed level. The collection of artefacts from this locality is small. It includes divergent edges splayed bit rounded butt cleaver, an elongated oval handaxe, nine scrapers and a few unmodified wastes. Raw materials employed for the manufacture of tools are sandstones, basalt, chert and jasper. The geological horizon in which these artefacts occur is a caliche bearing sandy-to-gritty clay with nodules, pebbles and cobbles of laterite, basalt, chert, Veinchert etc. An erosion cut terrace surface revealed here the following sequence, from top downwards.

0 m-1.70 m: Pale brownish to grey coloured clay with caliche, 1.0 cm nodules, rock fragments of grit size.

1.70m-2.10m: Caliche bearing sandy-to-gritty clay with 1.0 cm nodules. Pebbles cobbles, laterite, basalt, chert, Veinchert, caliche embedded in a sandy gritty clay matrix with iron oxide nodule fragments. Fossils and tools.

2.10 m - 2.50 m: Basaltic bed-rock

The occurrence of Acheulian artefacts at the Muluti Sadar Ghat locality, no doubt, established the stratified context of the assemblage, nevertheless it needs to be confirmed by digging at this locality whether this geological horizon is a regular tool-bearing horizon in the Chila valley. However, the typo-technological traits of the Acheulian artefacts do suggest that these belong to an Upper Acheulian tradition.

Further south, about 17 km from the Maluti Sadar Ghat and 12 km north from Suri, the district headquarters, in the vicinity of the basalt quarry, E/l -14 A (2) at Hatgacha Mouza, Mahammadbazar area, a reconnaissance survey yielded twenty-nine artefacts from atop a broad flat planer rock-surface. Here the country is rocky, and the surrounding flat-toped rocks present a terrace-like topography. Precambrian rocks at surface could be seen in many areas in the neighbourhood of Mahammadbazar. In Rajmahal, traps occur as the ubiquitous rocks in the region. The Tertiary sequence of felspathic and ferruginous sandstones, claybeds, chalk and limestones and laterite of variable thickness found to overlie directly the Precambrian in the Mahammadbazar area.

The tertiary rock-surface upon which the Palaeolithic artefacts have been found in the vicinity of the basalt quarry at Hatgacha mouza of the Mahmmadbazar area could, by no means, be their geological context. Nevertheless, the first discovery of Palaeolithic artefacts from this old landmass is significant from the viewpoint of the past hunter-gatherer's movement in the region. A preliminary analysis shows the collection is represented by scrapers (7:24.13 per cent), piergoirs (7:24.13 per cent), notches (4:13.79 per cent), burins (2:6.89 per

cent), blades (7:24.13 per cent), flake - blades (2:6.89 per cent), cores (2 :6.89 per cent) and 1 unmodified but halved agate piece. Chert predominates (89.65 per cent) over jasper (6.89 per cent) and agate (0.29 per cent) as raw material in this collection.

Judging from the overall character, composition, morphological and technological features of the collection in question, it would be difficult to place them in Middle Palaeolithic, nor they could be given the status of an Upper Palaeolithic. A similar kind of industry has been recognized in 1989 in the middle reaches of the Chila valley and, therefore, based upon typological analogy, the Hatgacha collection could well be a transitional Middle Palaeolithic-Upper Palaeolithic industry.

In addition to these archaeological observations, the Paruldanga area at 23° 42' 15" N and 87° 43' 20" E in Birbhum was re-explored and a geo-archaeological study of the site was also made. The microlithic context at Paruldanga is known, but this year the discovery of a blade-based leptolithic industry of the Upper Palaeolithic was made at Paruldanga. The artefacts occur immediately Upper Lalgarh formation and also from the zone of nodular laterite making up the upland. Over three hundred artefacts have been recovered from the old surface at Paruldanga in mint-fresh condition, thereby suggesting their primary context. Variously coloured cryptocrystalline rocks, chert, quartz, agate, camelian, quartzite and fossil-wood were utilized as raw material for making tools. This Upper Palaeolithic industry at Paruldanga includes one bone tool, possibly a hide-burnisher, and a variety of stone artefacts: curved-backed knives/points, straight-backed blades/knives or points, tanged-points, gravers or burins, beck-like boring tools, microlithic backed-blades/points etc., and debitage - cores, spalls, anvil etc.

The geo-archaeological studies at Paruldanga was undertaken in order to know the relationship between the Palaeolithic industries and their cover mateial. A total of four sediment samples representing the lithological sections were collected for ascertaining sedimentological properties and distinctiveness. From the surface finds and exposed lithosections, it has been possible to identify an ealier geomorphic surface here over which lies the slope wash material, equivalent in age to Katwa formation. The underlying laterites, Upper Lalgarh and Lower Lalgarh formations, are much older. The slope wash material incorporates two industries of the mesolithic and the underlying surface with an industry much of which is transitional to the mesolithic, but immediately below, in the zone of nodular laterie of Upper Lalgarh formation, the industry is truly Upper Palaeolithic.

85. Excavation at Rajpat, District Koch Bihar

S.B. Ota of the Kolkata Circle of the Survey, assisted by T. J. Baidya, T.J. Chakraborty, S. Maiti, S.K. Ghosal, A.K. Tewari, PC. Das, P. Biswas, K. Srimani, T. Dutta, R Nath, undertook excavation at Rajpat mound (89°21[1]12" E, 26° 9' 18"N)with a view to ascertaining the cultural sequ e of Koch Bihar area, hitherto unknown, as well as to understand the nature of settlement and town planning of medieval period that developed in this part.The other objective of the excavation was to solve the problem of origin of the Khens as well as the Koch who built up an empire here in the late medieval period.

Mound Rajpat measuring 1.85 m east-west and 150 m north-south with an average height of 12 m was the central citadel of the ancient capital of the Khen Kings who rose into prominence in the fifteenth century AD. The mound itselt enclosed by a brick enclosure wall is situated at the northern end of a quarter, defended by high and massive brick enclosure wall on all the four sides which were again encircled all along with a deep moat. On the other side which were again encircled all along a deep moat. On the other side of the moat there was a high mud embankment beyond which were other quarters of the royal personages, enclosed by another high mud rampart wall. Rajpat mound was thus a small and strong citadel inside a large citadel. Series of fortification walls thus remind us of the fortification system of the Vijayanagara Empire in south India.

In view of minimum possible destruction of the site and structures, it was decided to lay out trenches on the northwestern slope of the mound. The benches were laid in grid pattern. Altogether excavation was carried out in eighty-two quadrants of eleven trenches. Of these few trenches were laid down on the slope of the mound, a few within the fort itself while the rest of the trenches were dug up partially to co-relate the brick rempart wall with the structures, exposed in the mound. In a few quadrants, excavation was carried out to considerable depth and it was observed that the settlement started over the dried up bed of a river (possibly Dharala or Mansai).

In the course of excavation, structures of two different phases were exposed. In die top phase, just below the surface humus, excavation laid bare a badly damaged enclosure wall made of mud packed with brickbats, but encased with bricks at its top and on the facades below this structural phase on the foot of the mound in Qds III and IV of Trench No. YE-6, portion of a massive brick-built wall (5.6 m long and 5.1m high) was exposed at a depth of 1.5 m below surface, running in east-west direction. Altogether ninety-two courses ofbricks (including the foundation) of the wall were exposed. Its core was mainly of intact and broken bricks while its top and sides were faced with full size bricks. At regular intervals ramming with brick *zira* adjacent to this wall was noticed. Due to the limited nature of excavation the wall could not be exposed fully. It was possibly the inner enclosure wall-cum-forn'fication wall of the earlier settlement which also served the purpose of a barrier to stop the flowing of flood water.

In another trench, portion of mud packed brick wall was exposed which was possibly a buttress wall against die inner fortification wall, made to strengthen and safeguard it from the thrust of flood water. Further north, the brick rampart wall on die periphery of the mound was exposed on its inner side which was contemporaneous to the massive brick fortification wall mentioned above.

The bricks used in these walls are of varying size, viz., 28 X 19 X5 cm, 20 X 11 X 3 cm, 24 X 17 X 5 cm, 25.5 X 18 X 7 cm, 25 X 18 X 4 cm, 26 X 18 X 5 cm, 27 X 18 X 5 cm, etc.

The potsherds found during the course of excavation mainly comprise grey ware, black ware, red ware and red ware in various shades. But the grey ware followed by red ware and black ware was found in majority. But no major change either in shape

or in texture and decoration could be seen and the section also varies from thin, medium-to-thick. These are mostly made on wheel but a few hand-made and moulded specimens were also found. The shapes are vases, bowls, basins, dish, *handi,* lids, miniature pots, beakers, etc. Generally the potsherds are well fired with the application of slip on some of the sherds. The decoration mainly consists of incisions and stamps. Moulded varieties were also encountered. Of the interesting motifs mention may be made of the solar symbols, notches, zig-zag lines, wavy lines, loop pattens, etc. The solar symbol carries distant relationship with the pottery found at Ambari-a site near Guwahati in Assam.

Of all the antiquities, iron objects surpass other items in number, though some of the objects are unidentifiable. Objects comprise nails, arrow-head, hoes, clamps, etc. The copper objects also include mostly the nails and fragment of a miniature pot. Only four terracotta objects were recovered during the excavation. Of these, two were terracotta human figurines of hand-made variety, crudely fashioned, possibly indicative of some ritualistic affiliation.

86. EXPLORATION IN DISTRICT MEDINIPUR

S.B. Ota of the Kolkata Circle of the Survey, assisted by S. Maiti, and K Srimani explored the Village Kankrajhor and adjoining areas with a view to understanding the deposit bearing microlithic artefacts of the locality.

The village is located on the bank of River Kharsuti. The tool bearing horizon is about 35 cm below the reddish sandy silt. The artefacts include blade and flakes and cores of black chert. The artefacts occur in cluster.

Apart from the Stone Age tools the site also yielded three hero-stones, two in the Salbagan area (Nimbonga than) and one in the Kopardangapara at Kanaskocha.

SANSKRITIC AND DRAVIDIC INSCRIPTIONS[1]

ANDHRA PRADESH

1. Two Telugu Copper-Plates, Tirupati, District Chittoor

These two undated copper-plates, possibly part of a set, engraved in Telugu characters and language of sixteenth-seventeenth century AD, are preserved in the Tirupati Tirumala Devasthanam Museum, Tirupati. They contain compositions which were well known and attributed to Annamacharyya, a saint and composer who lived during the region of Venkata III, the Aravidu king. The songs are composed in different *ragas* like *Sankarabharana, Kannadagoula, Ritigoula* and *Malavagoula* and describe the passion and amorousness between god Venkatesvara and his consorts. Such compositions are called *sringaragitamulu* of'*sringarapatalu* in Telugu.

2. Kalyana Chalukya Inscription, Neredigunta, District Medak

This inscription, engraved on four sides of a pillar lying in the field of one Sangamesvara Reddy in the village, is written in Kannada language and characters (pl. 86). Dated in the eighth regnal year of Jagadekamalla II (AD 1145), it records the gift of one *matter* of land located at the beginning of the western canal of Pampasamudra for providing food offerings and to meet other expenses of the festivities in the months of Karttika and Vaisakha. A portion of money out of the income accrued form the sales made outside by the *nakharas,* a garden and *V2 matter* of land were gifted to the temple of Somanathadeva by *aseshaprabhus* of Neredugunte. The gift was made at the instructions of *mahamandalesvara* Permadi and *mahamandalesvara* Gundamanika Ahavamallarasa.

ORISSA

3. Two Inscriptions, Bhubaneswar, District Khurda

One of the two inscriptions, engraved on one side of a fragmentary stone slab discovered at the newly excavated site at Udayagiri - 2, now preserved in the office of the Superintending Archaeologist, Excavation Branch IV, Bhubaneswar, of the Survey, is in Sanskrit language and Nagari characters of about the ninth-tenth century AD. It mentions Bhagavam(van) *Vu(Bu)[ddha]* in the second line.

---

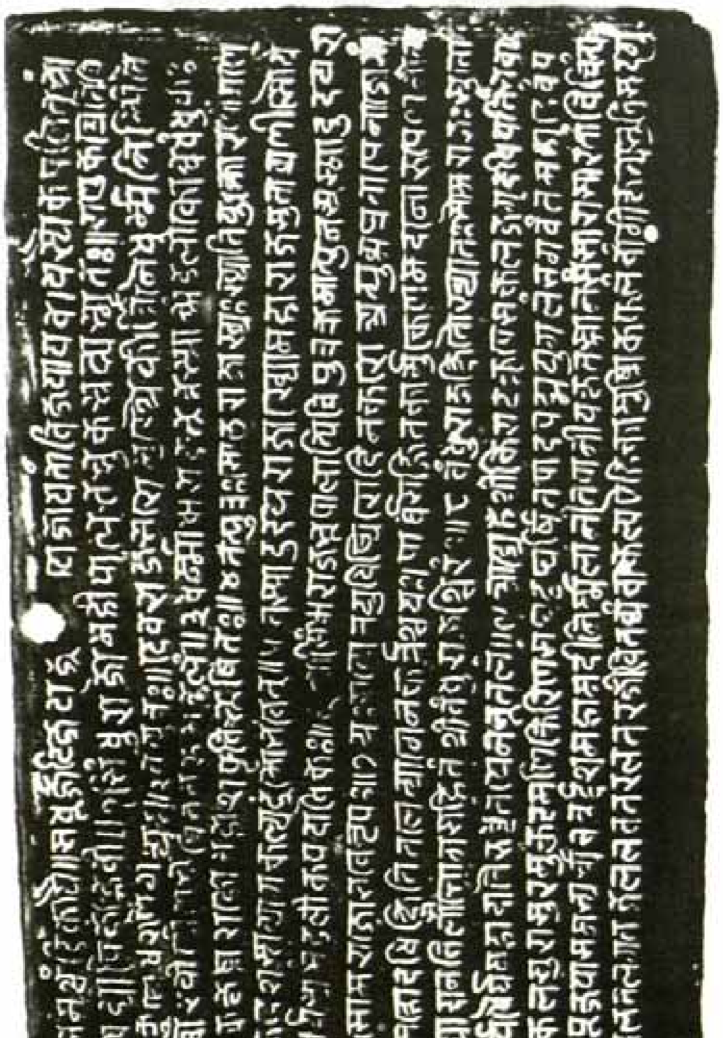
[1]Information from: M.D. Sampath, Director (Epigraphy), K.M. Bhadri and M.J. Sharma, of the Epigraphy Branch, Mysore; T.S. Ravishankar, Epigraphy Branch, North Zone, Lucknow and C.A. Padmanabha Sastry, S. Nagarjuna, K. Karuppaiah and S. Rajavelu, Epigraphy Branch, South Zone, Chennai.

Plate 86



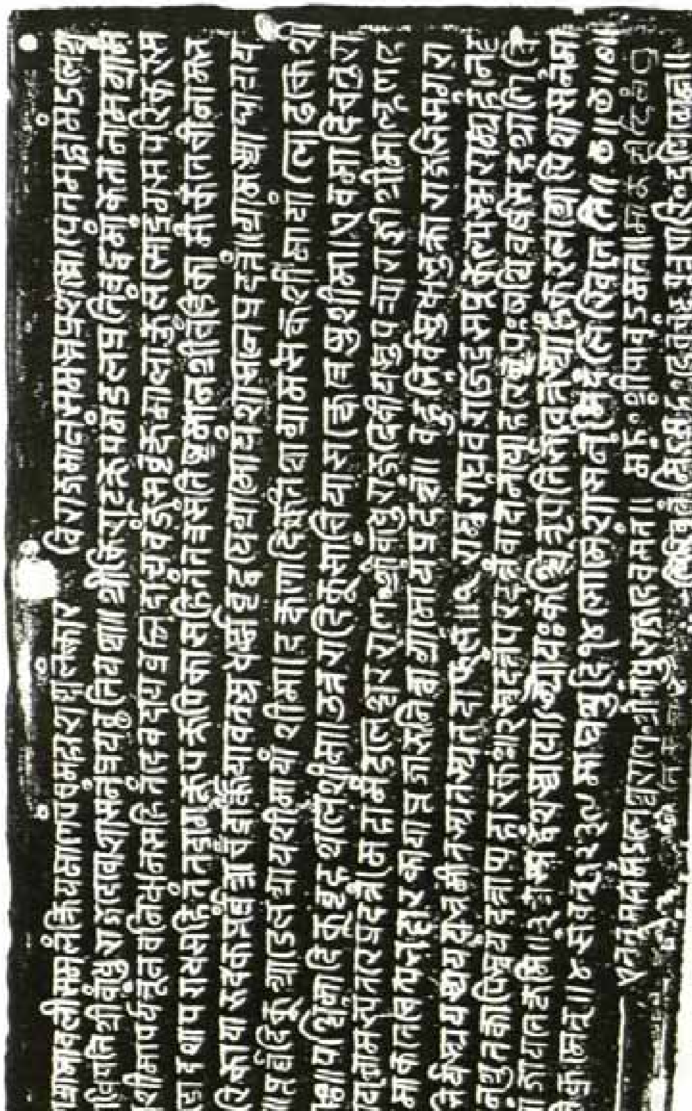
Neredigunta : Kalyana Chalukya inscription

Plate 87



Mungthala : copper plate charter

Plate 88



Mungthala : copper-plate charter

The second inscription, engraved on the other side of the same slab, is in the same characters as mentioned above, and its purport is not clear.

RAJASTHAN

4. COPPER-PLATE INSCRIPTION, MUNGTHALA, DISTRICT BADMER

This copper-plate charter (pis. 87-88), preserved in the State Museum at Jaisalmer, was discovered from Mungthala in Badmer. It is written in Sanskrit language and Nagari script and dated in Vikrama 1239 (AD 1182). The charter introduced for the first time by *Mahamandalesvara* Bandhuraja, son and successor of Somaraja (Somesvara), a ruler of Paramara dynasty of Kiradu branch. The charter which contains the genealogy of the family starting from Sindhuraja was issued from Kiratakupa (Kiradu), and refers to a grant of a village by name Mankata by Malhanadevi, queen of Bandhuraja, for meeting the expenses connected with the worship of goddess Sri-Chandika.

5. STONE INSCRIPTION, AMBER, DISTRICT JAIPUR

An incomplete inscription engraved on a stone slab kept in the Amber Museum is in Nagari characters and Sanskrit language and bears two dates Vikrama 1583 (AD 1525 and 1716) (AD 1658). It refers to the setting up of a *Kurmasila* on the former date and to the construction of the temple of Vimalesa (Vimalanatha) on the latter date at Ambavati situated in Dhundhahada-desa during the reign oi Maharaja Jayasimha, who is referred to as *mahamandalesvara* under *Patasahi* Shahajahan.

TAMIL NADU

6. CHOLA INSCRIPTION, VASISHTAPURAM, DISTRICT CUDDALORE

This Tamil inscription engraved on the south wall of the *garbhagriha* of Ranganatha Temple, in characters of thirteenth century AD, belongs to the eleventh regnal year of the king Rajaraja (AD 1227). It refers to the gift of land by a certain Kesavadevan, a *devar-senai-bogar* (a soldier of the troupe guarding the temple) as *tirunamattu-kani* to the deity at Tirumagilampandal towards the expenditure of procession, food offerings and burning lamp in the temple every month on the occasion of new moon day.

7. PANDYA INSCRIPTION, VASISHTAPURAM, DISTRICT CUDDALORE

This inscription engraved on the south wall of *Garuda-mandapa* of Ranganatha Temple belongs to the forty-first regnal year (AD 1309) of the Pandya king Kulasekharadeva. It registers a gift of 320 *kuli* of land as *tirunamattukkani* to the deity Periya-tiruvadi-nayanar at Tittakkudi *alias* Tiruchchirrambala-chaturvedimangalam by Ambalattadi Alagar of Ponparri at Karuvur in Naduvir-kurram (a sub-division) of Milalai-kurram in Pandi-mandalam for providing food offerings to the deity which was to be distributed among the itinerary Vaishnavite pilgrims.

8. NOLAMBA-PALLAVA INSCRIPTION, AIGUNDA-MPUDUR, DISTRICT DHARMAPURI

Engraved on the four sides of a pillar, lying in front of a ruined Siva temple in the village, this inscription in Kannada language and characters of about the ninth century AD belongs to the reign of

Mahendradhiraja Nolamba who is described as *Pallava-kulatilaka* and the destroyer of Mahabalikula. It refers to the gift of a field measuring 4 *khandugas* and twelve *khandugas* of dry land *(palum)* to the temple *of Karmata* at Aingunda by Gangaranu and Benayya. The former is stated to have ruled over Eyilnadu under the above mentioned Nolamba-Pallava king. At the end also refers to the gift of a *sthana* by Magoda-sakti to Dharmasakti and *Valiyasthana* of Mandesvara at Tagaduru.

9. CHOLA INSCRIPTION, ERRASEGALAHALLI, DISTRICT DHARM APURJ

This inscription engraved on a dolmen-like hero-stone is in Tamil language and characters and dated in the fourth regnal year (AD 1056) of Chola king Rajendra II. It records the death of a hero Vichcha Kamundan, son of Pichcha Kamundan in a wild boar hunt at Pandi-Kamunda-palli in Pulla-mangalam, a village in Ganga-nadu (a sub-division) ofTagadur-nadu of Vijaya Rajendra-mandalam.

10. CHOLA INSCRIPTION, JAGADAP-MOTTUR, DISTRICT DHARMAPURI

This hero-stone inscription in Tamil language and characters dated in the fifth regnal year (AD 1057) of the Chola king Rajendradeva (Rajendra II). It records the death, due to snake bite, of a certain Chamundan, a resident of Avanamachchipalli, a hamlet of Pulla-mangalam, a village in Ganga-nadu, sub-division of Tagadur-nadu of Vijaya Rajendra-mandalam. Also records the *sati* committed by his wife Vichchakkan.

11. MILESTONE INSCRIPTION, MUTTANUR, DISTRICT DHARMAPURI

This inscription in Tamil language and characters of about the twelfth century AD is found engraved on a milestone in a field in the village. It refers to the highway *Adiyaman-peruvali* and marks the distance to a place called Navartavalam, as twenty-seven *kadam.* It is significant to note that the distance is indicated at the end of the inscription by scooping out two big holes and seven small holes representing the number twenty-seven.

12. CHOLA INSCRIPTION, PATTALI, DISTRICT ERODE

This inscription, engraved on the either side of the door-jambs of a small Amman Temple, is in Tamil language and characters. It belongs to the tenth regnal year (AD 1090) of Kongu Chola ruler Abhimana Chola Rajadhiraja. It refers to the construction of a *Pidari* Temple by a lady Kalikuvichchi Nagan Silambi in memory of her husband Kavan Araiyan of *Kurum-pullar* community.

13. CHOLA INSCRIPTIONS, PENNAKONAM, DISTRICT PERAMBALUR

These two inscriptions, engraved in the Madhurantisvara Temple are in Tamil language and characters and belong to the Chola king Rajarajadevar. Of them, the first one, on the south wall of *mukha-mandapa,* dated in the fifteenth regnal year (AD 1231) of the king, refers to the renewal of the gift of sixteen *sandhi* lamps which was earlier instituted by Kasyapan Arasan Uyyaninraduvan-bhattan and a certain Umaiyal of Tadapadi in the same temple. The second one, on the same side, on the wall of *arddha-mandapa,* records the gift of one hundred and fifty *kasu* by Brahmani Umaiyandal, the daughter of one Atreyan Yajnan of Tirumangalam, a brahmadeya village in Kalar-kurram of Rajaraja-

Plate 89



Talutalai : Chola inscription

valanadu. The gift was entrusted to the priests Kasipan-Araisu Uyyaninradi, Tayandevan and Marudan Chenni, for burning a lamp before the god Tirumadhurantak-isvarar at Perunerkunram of Ugalur-kurram in Rajasihgai-valanadu.

14. CHOLA INSCRIPTION, TALUTALAI, DISTRICT PERAMBALUR

This inscription (pi. 89), engraved on a stone slab set up in front of a ruined Kailasanatha Temple is in Tamil language and characters. It belongs to the sixth regnal year (AD 1024) of Chola king Rajadhirajadevar and refers to the installation of images of gods Chandrasekhara, Kuttadundevar (Nataraja) and the goddess Nachchiyar in the temple of Talutalai Mahadevar Vada-kayilasamudaiyar at Talutalai for the merit of Magadai-nadalvar *alias* Sembai Nayagan by one Aragalur Velan Nilan Nayagapperumal. It further states that he made a gift of land for providing food offerings and burning *sandhi* lamps to the above deities and to god Ganapati.

15. CHOLA INSCRIPTION, VAYALOGAM, DISTRICT PIIDUKKOTTAI

This inscription, in Tamil language and characters, is engraved on three broken slabs kept in the local temple named Pidari-kovil in the village. It refers to a king named Rajakesari who may be identified with the Chola king Sundara Chola. Dated in his third regnal year (AD 960), it records the gift of three *ma* of land as *kula-patti* for the maintenance of a tank in the Village Vayalogam by the sword-regiment *(val-padai)* named Vira Chola Ilanko-velar and body-guard called *udanilai sevagar.*

UTTAR PRADESH

16. SATI-STONE INSCRIPTION, SATAGATA, DISTRICT LALITPUR

This sari-stone inscription fixed in the ground near the Vishnu temple is in local dialect and Nagari characters and dated [Vikrama] 1451 (AD 1394). It records the performance of *sahagamana* during the reign of *maharajadhiraja sultan* Mahmud Shah and Dilavar Khan (governor of Malwa) in Chanderi-desa.

17. JAIN A INSCRIPTION, SIRONAKHURD, DISTRICT LALITPUR

This inscription, engraved on the pedestal of an image of the Jaina Tirthankara, Adinatha kept near the Jaina Museum, is in Sanskrit language and Nagari characters of about the eleventh century AD. It mentions *sreshthi* Grihadasa who was probably responsible for the making of the image.

18. SATI-STONE INSCRIPTION, THANAVARA, DISTRICT LALITPUR

This soft-stone inscription, partly damaged and fixed in a field belonging to Shri Sharman Rayakvar, is in the local dialect and Nagari characters and dated [Vikrama] 1622 (AD 1565). It records the performance *of sati,* mentions certain individual names and refers to Thanavara (name of the village).

ARABIC AND PERSIAN INSCRIPTIONS

ANDHRA PRADESH

1. Miscellaneous Epigraphs, District Hyderabad

A good number of inscriptions have been copied/photographed from different parts of Hyderabad. Of these, the earliest one is a brief chronogram-based Persian record in Nastaliq characters, copied from a local tomb, that reads: *Ya Makhfi al-Husaini Banda* Nawaz, yielding the date AH 1035 (AD 1625-26), obviously for the death of the saint Sayyid Shah Makhfi al-Husaini Chishti *alias* Khwaja Salar, a descendant of Sayyid Muhammad Husaini Gesu Daraz. The saint flourished during the reign of Sultan Muhammad Qutb Shah (AD 1612-26). Sayyid Murad Ali Tali also in his work *Tadhkira-i-Auliya-i-Hyderabad* (pt. I, pp. 49-52), correctly mentions the date of death as AH 1035. But Maulavi Abu Turab Muhammad Abdul Jabbar Sufi. Malkapuri, in his voluminous work *Mahbub-i-Dhil Minan Tadhkira-i-Auliya-i-Dakan* (ii, p. 835) wrongly gives his date of death as AH 1140.

Among other epitaphic records from Hyderabad, the first one in Persian is a later installation, which registers the dates of birth and death of a pious and learned person Hadrat Hafiz Mir Shamsuddin Muhammad Faid who was born in AH 1195 (AD 1780-81) and died in AH 1283 (AD 1866-67). In the light of the work *Dastan-i-Adab-i-Hyderabad* (pp. 207-221), by Sayyid Muhyiud Din *Qadiri* Zor, it may be added that he was a versatile personality who played dominant role in the field of academic achievements and literature under the later Asaf Jahi rulers of Hyderabad. He was closely associated with Fakhrud Din Khan Shamsul Umara, a high official and scholarly personality. He was a Hafiz (one who has got the whole *Quran* by heart), master poet, eminent author and a saintly figure-all rolling into one.

While the second epitaph in Urdu records the death of Allah Rakha Saudagar (i.e., a merchant) in AH 1299 (AD 1881-82). The third one is a loose epitaph in Persian composed by Dard, recording the death of a pious and learned person Sayyid Gulzar Ali son of Mir Sayyid Khurshid Ali in AH 1305 (AD 1887). The fourth one obviously records the death of Hadrat Daud Ali Shah, a saintly figure, in AH 1316 (AD 1899).

A couple of records from two different mosques in Hyderabad pertain to their construction. Of these, the first one in Persian composed by Ghubar, records the construction of the mosque (obviously the Phul Bagh Masjid from where the epigraph was copied) at the order of Sir Maharaja Bahadur, in AH 1327 (AD 1909-10). Sir Maharaja Bahadur, referred to in the inscription is none other than the reputed Raja Kishan Pershad son of Raja Harikrishan Bahadur, honoured with the hereditary post of *Peshkari* (deputyship) for life and *Madarul Muham* (prime minister) from AH 1319 (AD 1901) to AH 1330 (AD 1912). He was an accomplished poet with the pen-name Shad, oriental scholar and a versatile grand

[1]Information from: M. Ilyas Quddusi, assisted by M. Yaseen Quddusi and G.S. Khwaja of the Epigraphy Branch, Arabic and Persian, Nagpur. One hundred and twenty-five inscriptions were copied, examined and reported on during the year under review, out of which important ones are noticed here.

nobleman *(The Chronology of Modern Hyderabad,* from AD 1720 to 1890), published by the Central Records Office, Hyderabad Government, Hyderabad, 1954 (Index, p. 18). The composer Ghubar can be identified with Sadiq Husain Ghubar, a learned scholar, who helped the Maharaja Bahadur Shad in all his academic and literary activities as evidenced by Sayyid Muhyiud-Din Qadiri Zor in his work (p. 259) cited above. The other inscription is a new one, recently installed by Alhaj Mirza Abdul Qadir Beg, mentioning that Masjid Sahib Khan, originally built in AH 1213 (AD 1798-99), was constructed anew in AH 1414 (AD 1993-94).

2. Miscellaneous Inscriptions, District Medak

Among the inscriptions copied from Sangareddi, one Arabic record belongs to the local Jami Masjid and four epitaphs pertain to various graves situated in the courtyard of the said Jami Masjid. Without mentioning the name of the builder etc., the Jami Masjid inscription in beautiful hand in Naskh style, records only *Basmala,* the first Creed and the date AH 1244 (AD 1828-29). The date mentioned in the epigraph is obviously for the construction of the Jami Masjid. The names of the deceased (in a couple of cases names not mentioned) in the epitaphs along with their dates of death are: Hafiz Muhammad Munawwar Peshawari, i.e., of Peshawar, AH 1290 (AD 1873-74), who academically and in religious studies benefitted from Akhund Sahib of Swat (now in Pakistan); mother (name not given) of Safdar Husain, AH 1306 (AD 1888-89), the metrical text in Arabic in beautiful Thulth characters, having been composed by a poet Khatir; daughter (name not mentioned) of Safdar Husain, AH 1308 (AD 1890-91), and Sayyid Abdul Wahhab Mysuri, i.e., of Mysore, AH 1309 (AD 1891-92).

DELHI

3. Miscellaneous Inscriptions, District Delhi

Among the inscriptions photographed from different parts of Delhi, four epigraphs are worth noticing. The first one, which is a later installation in Persian, comes from a tomb, recording the date of the death of Hazrat Khwaja Shamsud-Din Autadullah who expired in AH 700 (AD 1301). It may be remarked that the deceased saint was contemporary of Hadrat Nizamud-Din Auliya and died in the reign of Alaud Din Khalji. The second inscription in Persian, again a later installation, records the death of the famous saint Shamsul Arifin Siraju's Salikin Hadrat Makhdum Khwaja Shaikh Muhammad Nasirud-Din Mahmud Raushan Chiragh Dehlawi Awadhi Chishti Nizami, in AH 757 (AD 1356). The inscribed slab was offered for installation by Maulana Sufi Shah Muhammad Nasimud-Din Qadiri Chishti, Sajjada Nashin-i-Dargah Hadrat Mahbubul Arifm Khanqah-i-Qadiriyya Ghauthabad Sharif, Sultanpur, Awadh, Uttar Pradesh. The third record in Arabic, executed in Naskh in Tughra, pertains to a grave inside Nai-ka-Gumbad (Barbar's Tomb) in Humayun's Tomb-Complex. This important inscription comprises Quranic text (Chapter LV, verses 26-27) and the date AH 999 (AD 1590-91) without mentioning the name of the occupant of the grave. Whether the brief inscription under reference, belongs to the grave of the barber of Emperor Humayun, is difficult to say. The fourth epigraph in Persian comes from the historic Fatehpuri Masjid that registers repairing of the mosque in AH 1289 (AD 1872-73) at the instance of Haji Muhammad

Taqi and under the supervision of Haji Qutbud-Din and Ghulam Muhammad Khan.

KERALA

4. Miscellaneous Inscriptions, District Thrissur

A later installation but of great importance is the brief inscription photographed from the compound-gate of the Jama Masjid at Kodungallor, recording the name of the mosque as Cheraman Juma Masjid along with the date *Hijrat Sana 5* (AD 626-7), and the place name as Kadaallur (i.e., Kodungallor as presently called). It is believed that as early as the days of the *Hijrat,* the message of the Prophet Muhammad reached the west coast of India and the first mosque was built at Kodungallor. It is to be specifically remarked that the modern inscription under reference seems to be based on some available literary sources.

Another important inscription in metrical Arabic in Naskh characters was copied at Puthiya Kavu from the suburb of the Juma Masjid (pl. 90). This inscription is carved on a wooden plank, recording the martyrdom of a famous person named Marakkar son of Sayyid Ahmad al-Fidya, in AH 1245 (AD 1829-30). It is very interesting to note that in the Arabic text of the epigraph, the village name is spelt as *Fidya Aqru* (i.e., Puthiya Kavu as presently it is called).

MAHARASHTRA

5. Miscellaneous Epigraphs, District Mumbai

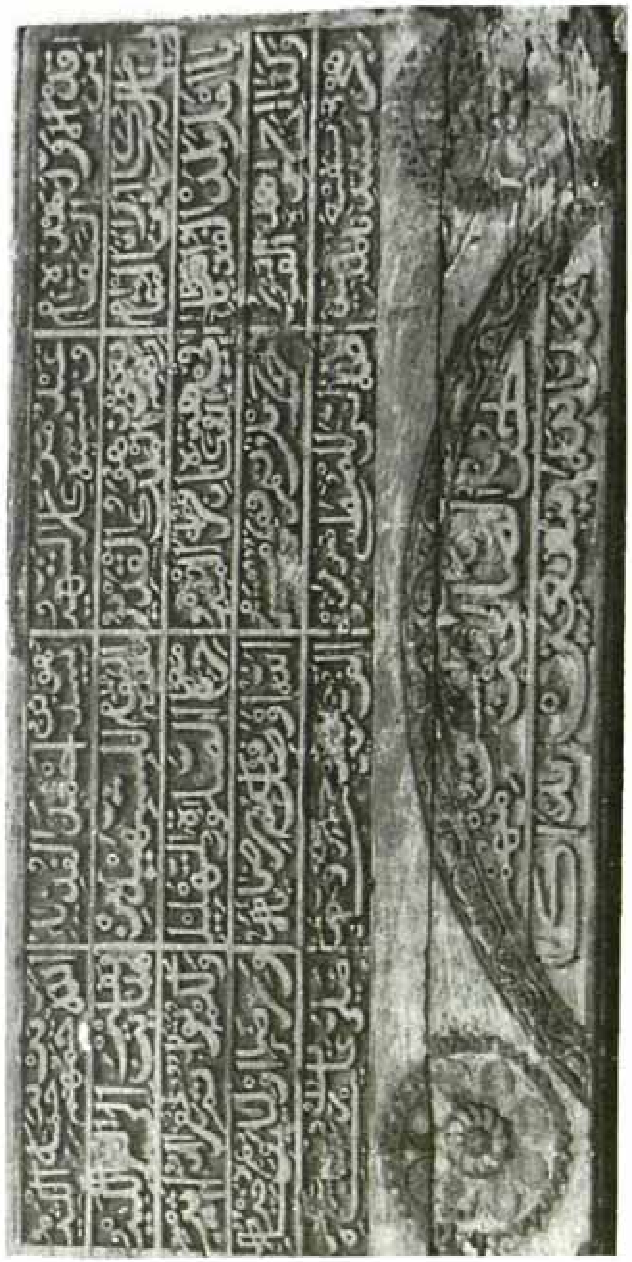
From Mumbai proper come a couple of records in Persian recording the death of a saintly figure Hadrat Sayyid Husain *alias* Mastan Shah Qadiri in AH 1203 (AD 1788-89) and the other in metrical Urdu composed by Tajammul and calligraphed by Taiyab Husain Ridawi, registering the erection of a mosque by Haji Adam son of Siddiq in AH 1321 (AD 1903-04).

6. Epitaphs, District Nagpur

A good number of epitaphic records have been copied from the local Muslim graveyard at Kamthi. Among them seven epitaphs are worth noticing here. The first one is an Urdu epigraph, recording the death of Ruqaiyya Bi, aged six year and two months, in AH 1304 (AD 1886), who was the daughter of Qadir Sharif Hawaldar and grand daughter of Maruf Ali Shah Qadiri Chishti (popular as) Sayyid Badshah Madani of the fourth *Risala* of the Madras Regiment. A poet with the pen-name Mujrim was the composer of the metrical text. The poet also finds mention in a record copied earlier from the same place at Kamthi *(Annual Report on Indian Epigraphy, 1979-80,* Appendix C, No. 109).

Halim Sahib father of Bakar Qasab (mutton seller) Yusuf Sahib of the Risala Bazar locality passed away in AH 1304 (AD 1887) as evidenced by the second epitaph. The third one is a bilingual metrical inscription in Arabic and Persian composed by Salim, recording the death of Radiyya Bi in AH 1309 (AD 1892) who was the wife of Shaikh Muhy Din (i.e., Muhyiud Din) and mother of Muhammad Ishaq and the daughter of Kulthum Bi and Muhammad Silar. The composer of the bilingual metrical texts, Salim, mentioned in this record, also finds reference as the composer of another Urdu epigraph copied earlier from the same graveyard at Kamthi *(Annual Report on Indian Epigraphy, 1979-80,* App. C, No. 102). In the light of the present and earlier copied records, this fact is well established that the poet Salim was well-versed in composing verses in all the three languages, i.e.,

Plate 90



Puthia Kavu, Thrissur : Arabic Inscription

Arabic, Persian and Urdu. The fourth one is a slightly damaged metrical epigraph in Persian that records the death of Shaikh Sadrud Din son of Muhammad Hashim, a youth aged twenty years and resident of Kiyamti (i.e., Kamthi), in AH 1310 (AD 1892). The fifth one in Urdu records the death of Abdullah Khan Nazir Khan in AH 1312 (AD 1894) while the sixth one in Persian registers the death of Shaikh Kallu *Chudi Farosh* (i.e., bangle-seller) son of Shaikh Sultan, at the age of thirty in AH 1313 (AD 1895). The last epitaph records the death of Bannu Bi wife of Late Abdul Qadir Gau *Qassab* (i.e., a butcher) in AH 1315 (AD 1897).

UTTAR PRADESH

7. Miscellaneous Inscriptions, District Jaunpur

Among the inscriptions copied from different parts of Jaunpur, mention may be made of the following. An epitaph in metrical Persian, copied from the compound of Khalis Mukhlis Mosque, records the death of one Kazim Ali in AH 1223 (AD 1808-09). A metrical record in Persian composed by Malik was photographed from the place called Shah-ka-Panja that registers the construction of the door of the shrine by Taufiq in AH 1229 (AD 1813-14). A ruined mosque in Mahalla Baluch Tola bears an Arabic inscription that records that the mosque was built in AH 1231 (AD 1815-16) by Nur Muhammad. Another epitaph in the compound of Khalis Mukhlis Mosque referred to above, simply records the name Sayyid Didar Ali and the date AH 1241 (AD 1825-26). According to a literary source *Nasab Nama* (p. 40) by Sayyid Muhammad Jafar, the deceased Sayyid Didar Ali was the son of Kazim Ali, who is mentioned above.

Sayyid Muhammad Nasir Khan Bahadur Dhul Qadr was the builder of the edifice, i.e., the Imambara in Jaunpur in AH 1283 (AD 1866-67) as evidenced by the brief bilingual inscription in Arabic and Persian fixed on its fagade. According to Sayyid Muhammad Jafar, the author of the work *Nasab Nama* (p. 53), the builder was the son of Sayyid Didar Ali and grandson of Kazim Ali, both mentioned above, and served under the British government as tehsildar *pargana* Nizamabad, *munshi* under the collector of Kanpur, as tehsildar of Shivli Shivrajpur and Qannauj. He became deputy collector in AH 1251 (AD 1835-36) and having served at Gorakhpur, Ghazipur, Kanpur, Agra and Allahabad expird at Allahabad at the age of fifty-seven. Because of his meritorious services in various capacities, the British government had bestowed on him the title of Khan Bahadur Dhul Qadr. He passed away in AH 1283 (AD 1866-67).

One more epitaph in the compound of Khalis Mukhlis Mosque, records the chronogrammatic phrase containing the name Sayyid Mansur Ali, that yields the date ofhis death AH 1285 (AD 1868-69). It may be added that the deceased Sayyid Mansur Ali was the younger brother of Sayyid Nasir Khan Bahadur Dhul Qadr who is mentioned above. He held the post of deputy collector during the mutiny of 1857. Someone played mischief against him, saying that he was a mutineer. Under suspicion he was arrested and was to be hanged. It was at the intercession ofhis elder brother Sayyid Nasir Khan Bahadur, who through the Governor General, got him set free (*Nasab Nama,* p. 43).

Sayyid Hadi Ali passed away in AH 1292 (AD 1875-76) according to the epitaph at his grave in the compound of Khalis Mukhlis Mosque. It may be added here that Sayyid Hadi Ali was the son of Sayyid Didar Ali and younger brother of Sayyid Nasir Ali and Sayyid Mansur Ali, all the three mentioned above.

8. Miscellaneous Epigraphs, District Mirzapur

An epitaph in Urdu was copied from Kantit, recording the death of the wife (name not given) of Shaikh Imam Bakhsh, *Darugha-i-Thana* Bindyanchal, resident of *Qasba* Saket in the District Mainpuri in AH 1253 (AD 1837).

Among the records copied and photographed from various parts of Mirzapur proper, eight inscriptions are worth mentioning. Of these, the earliest one in Persian is dated Fasli 1203 (AH 1208 AD 1793), the year when the mosque situated near the Qadam-i-Rasul in Mahalla Imambara, was built. The name of the builder is not mentioned in this brief inscription.

The mosque in Trimuhani locality bears a Persian inscription, saying that this mosque was constructed by (name not given) *Nazir-i-Khasi* (or Ghasi), i.e., Superintendent of Khasi or Ghasi in AH 1222 (AD 1807). It also records that the income accruing from the nine small halting places or rooms *(nuh manazil-i-kushak)* situated below this mosque at the south and north sides, is endowed for the mosque (towards its multifarious expenses).

Four epitaphic Persian inscriptions come from a local graveyard called Karbala-i-wala-Qabristan in Mahalla Imambada. The first one obviously records the death of Ghulam Murtada, the servant of the *Imambada* in AH 1248 (AD 1832). While the second one registers the death of Bibi Nasiban daughter of Murad Khan in AH 1271 (AD 1855). The third one pertains to the grave of Bibi Udasi wife of Shaikh Ghazi Bakhsh, native of Ilahabad, i.e., Allahabad, Mahalla Elliot-Ganj, who passed away in AH 1277 (AD 1860). The last one is dated AH 1278 (AD 1861) when Mihr Din Ali son of Piran Ali expired.

Among the records from Mirzapur, a couple of them are in Urdu. Of these, the first one is in the metrical form composed by Shakir. It records that when Amena aged fourteen years passed away, her parents were greatly dejected and it was with a view to providing solace to her departed soul (and for her merit in the next world) that her father Akbar Ali Khan constructed the mosque in AH 1293 (AD 1876-77). The second inscription pertains to the Town Hall, saying that the foundation of this edifice, i.e., the Town Hall, was laid during the time of Mister George Well Sahib Bahadur, magistrate of the District Mirzapur, under the supervision of Bisheshar MistriinAD1878.

9. Inscription in a Palace, District Sonbhadra

Historically of great importance is the brief Persian inscription in crude Nastaliq characters that was photographed from the place called Agori. Dated AH 1020 (AD 1611-12), it refers to *Mahal-i-Madho Singh* (i.e., palace of Madho Singh) (built in) *pargana* Akori (i.e., Agori) in *sarkar* Chunar and further says that whoever dismantles the palace, will incur the curse of divorce to one's wife, so also to one's daughter. Madho Singh, referred to in the inscription, can be identified with Madho Singh Kachhwaha son of Raja Bhagwandas who had been associated with the Mughal court under Akbar and Jahangir (Shah Nawaz Khan, *Maathir-ul-Umara,* iii, pp. 321 -22). Until the time of Akbar, Agori *as pargana* in the *sarkar* of Chunar, is not heard of nor does the *Ain-i-Akbah* by Abul Fazl include the name Agori *pargana* as such in the *sarkar* of Chunar. In the light of the present inscription a new piece of information is revealed about Agori *as pargana* headquarters in the *sarkar* of Chunar under Jahangir.

III. NUMISMATICS AND TREASURE TROVE

PUNJAB

1. COPPER COINS, AMRITSAR, DISTRICT AMRITSAR

Chandigarh Circle of the Survey, acquired sixteen copper coins of Mughal period from Assistant Commissioner (Disposal), Custom Commissionerate, Amritsar.

WEST BENGAL

2. STONE AND METAL SCULPTURES, SILIGURI, DISTRICT DARJILING

Forty-two pieces of stone sculptures were handed over to the representatives of the Kolkata Circle of the Survey by the Siliguri Customs Division. These include stone idols of Vishnu, Parvati, Ganesa, Surya, Buddha, Sarasvati, Uma-Mahesvara (pl. 91). The metal sculpture is represented by a sculpture of Lord Vishnu. These sculptures mostly belong to the tenth-twelfth century.

The antiquities mainly comprising stone idols of Vishnu, Devi, etc. and metal images of Radha and Krishna were also received by the Naxalbari Customs Division. While the stone images are of tenth-twelfth century, the metal images belong to the eighteenth-nineteenth century.

T.J. Baidya and S.K. Ghosal of the said Circle, also examined antiquities seized by the Customs Authority of Bagdogra Airport. Two metal images of seated Buddha in *dharmachakrapravartana mudra* were identified. Both these images belong to the Sarnath School, datable probably to the early medieval period.

3. STONE IMAGE OF BENUGOPALA, KOCH BIHAR, DISTRICT KOCH BIHAR

One stone image of Benugopala, recovered from the river bed was examined in the Sitai Police Station by T.J. Baidya and S.K. Ghosal of the Calcutta Circle of the Survey. It seems that the sculpture belongs to the seventeenth-eighteenth century.

Plate 91



Siliguri : stone sculpture of Uma-Mahesvara

IV. OTHER IMPORTANT DISCOVERIES

HIMACHALPRADESH

1. LOOSE SCULPTURES AND ARCHITECTURAL FRAGMENTS, KANGRA FORT, DISTRICT KANGRA

Piyush Bhatt of the Chandigarh Circle of the Survey, documented one hundred and twenty-two loose sculptures and architectural fragments datable from the ninth-tenth to the sixteenth-seventeenth century AD.

2. LOOSE SCULPTURES AND ARCHITECTURAL FRAGMENTS, ROCK-CUT TEMPLE, MASRUR, DISTRICT KANGRA

Piyush Bhatt of the Chandigarh Circle of the Survey, documented eighty-three loose sculptures and architectural fragments datable from the tenth-eleventh to the sixteenth-seventeenth century AD.

3. LOOSE SCULPTURES AND ARCHITECTURAL FRAGMENTS, BASESHVARA MAHADEO TEMPLE, BAJAURA, DISTRICT KULLU

Rahul Bhosle of the Mini Circle, Shimla, of the Survey, documented seventeen loose sculptures and architectural fragments datable from the ninth-tenth century AD.

4. LOOSE SCULPTURES AND ARCHITECTURAL FRAGMENTS, GAURI SHANKARA TEMPLE, DASSAL, DISTRICT KULLU

Rahul Bhosle of the Mini Circle, Shimla, of the Survey, documented twelve loose sculptures and architectural fragments datable from the seventeenth-eighteenth century AD.

5. LOOSE SCULPTURES AND ARCHITECTURAL FRAGMENTS, GAURI SHANKARA TEMPLE, JAGATSUKH, DISTRICT KULLU

Rahul Bhosle of the Mini Circle, Shimla, of the Survey, documented twenty-two loose sculptures and architectural fragments datable from the seventeenth-eighteenth century AD.

6. LOOSE SCULPTURES AND ARCHITECTURAL FRAGMENTS, GAURI SHANKARA TEMPLE, NAGGAR, DISTRICT KULLU

Rahul Bhsole of the Mini Circle, Shimla, of the Survey, documented twenty loose sculptures and architectural fragments datable from seventeenth-eighteenth century AD.

7. LOOSE SCULPTURES, ARDDHANARISHVARA TEMPLE, MANDI, DISTRICT MANDI

Rahul Bhosle of the Mini Circle, Shimla, of the Survey, documented five loose sculptures datable from seventeenth-eighteenth century AD.

8. LOOSE SCULPTURES, PANCHAVAKTARA TEMPLE, MANDI, DISTRICT MANDI

Rahul Bhosle of the Mini Circle, Shimla, of the Survey, documented eleven loose sculptures datable from seventeenth-eighteenth century AD.

9. LOOSE SCULPTURES AND ARCHITECTURAL FRAGMENTS, TRILOKINATHA TEMPLE, MANDI, DISTRICT MANDI

Rahul Bhosle of the Mini Circle, Shimla, of the Survey, documented one hundred and sixty-three loose sculptures and architectural fragments, datable from seventeenth-eighteenth century AD.

JAMMU AND KASHMIR

10. DECORATED TERRACOTTA TILES, KANISPUR, DISTRICT BARAMULLA

B.R. Mani of the Srinagar Circle of the Survey, assisted by Sujeet Nayan and Raghubir Singh, discovered decorated terracotta tiles with Kharoshthi numerals, leaf motifs, semicircular lines forming geometrical designs, fish-scale design, border lining of leaves, small circular stamps, simple lining with motif looking like hanging clock with cross lining in the centre around which eighteen circles are depicted, full blown flower below the petal, medallions and *dharmachakra* motifs three each below it. Being simple in their forms and mouldings these seem to be earlier in date than Harwan tiles.

11. EARLY HISTORICAL SITES NEAR CHENAB, DISTRICT JAMMU

Sujeet Nayan of the Srinagar Circle of the Survey, located early historical sites at villages Dhok Khalsa, Jorian, Nimesh Tibba and Gol Patan.

12. MEDIEVAL BAOLIS, DISTRICT KATHUA

Samir Diwan of the Srinagar Circle of the Survey, located medieval Baolis in the villages Teerdi, Sundari, Thane, Tutthal and Mortha. Some late medieval sculptures were also noticed near Baolis at Sundari.

13. SCULPTURES, NARANAG, DISTRICT SRINAGAR

B.R. Mani of the Srinagar Circle of the Survey, discovered two stone sculptures of Vishnu (pl. 92) and *gaja*-Lakshmi (pl. 93), datable to *circa* eighth century AD from the northern periphery of the group of temples in a heap of debris.

MADHYA PRADESH

14. MEGALITHIC SITE, TELAI DABRA, DISTRICT BILASPUR

In the course of expeditions conducted in Bilaspur district of Madhya Pradesh, S.K. Tiwari, Head of the department of Tribal Studies, Rani Durgavati Vishwavidyalaya, Jabalpur,discovered a megalithic site. The nearest habitation Telai dabra (22° 32' N; 81 ° 45' E) is a tribal village with two hundred and fifteen population less than 2 km northwards from the site. Keonchi, the largest village on the southeastern foot hills of Maikal range is about 22 km and Kabir Chabutara, the gateway to Amarkantak is 39 km from the site.

The megalith consists of a stone circle of 2 m in diameter with two menhirs of 4.15 m in height. The pinnacle of one of the menhirs is broken. It is lying nearby in pieces. The menhirs are facing north-south direction.

Each one of the menhirs seems to be a soild conical stone structure. But a close look reveals as if each menhir is not one single stone but it is prepared by two vertical conical stone logs, having only one side smooth. While erecting the menhir, the two stones were put together on the smooth surface side, to give an impression of one soild block.

The discovery is important as so far no megalithic burial was found either in Bilaspur or in

Plates 92-93



92

Naranag : Vishnu



93

Naranag : Gaja-Lakshmi

the adjacent Mandla district. The tribals living in the adjacent villages of the site belong to the Gond and Baiga communities. A few tribals of Kamar community also inhabit the region. When asked about the menhirs from the residents of Telai dabra, most of them preferred not to speak anything about it. But they knew the site. One old Baiga after persuasion informed that it was a very old and an abandoned sacred place. However, no rituals or sacrifices were known to be performed at the site. The Baiga tribe believed that the two menhirs were the ancient relics of Baghdeo (Tiger deity) and pointed out some similarity with lower canines of a tiger.

TAMIL NADU

15. Vishnu Sculpture, Sirukundram, District Kanchipuram

G. Thirumoorthy of the Chennai Circle, of the Survey, noticed a stone sculpture ofVishnu in the midst of an agricultural field. The sculpture ofVishnu 1.6 m high, in *samabhanga* posture with*prayoga chakra,* is datable to the eighth century AD.

16. Sculpture, Vadakkupattu, District Tiruvallur

G. Thirumoorthy of the Chennai Circle, of the Survey, noticed a sandstone bas-relief sculpture of Jyeshtha, assignable to *circa* seventh century AD which is considered to be the earliest in this region.

17. Middle Palaeolithic Tools, Vanamalli, District Tiruvallur

G. Thirumoorthy of the Chennai Circle, of the Survey, noticed Middle Palaeolithic handaxes and scrapers of quartzite in the village Vanamalli while carrying out documentation work.

18. Sculptures and Coins, Districts Chidambaram, Perambalur, Pudukkottai Villupuram and Virudhunagar

S. Krishnamurthy, Senthil Selvakumaran, R. Muthu, C. Santhalingam, Gowthamaputhiran, S. Selvaraj, D. Gopalan and Selvaraj of the Department of Archaeology, Government of Tamil Nadu, reported the discovery of sculptures of two Ipanars, one Muruga, one goddess and one Thirthankara sculptures which were located at Kilaiyanur (District Villupuram), Kilaperumpakkam (District Chidambaram), Kundapuram, Perambulur taluk, Kurumpundi (District Pudukkottai) respectively. One Roman coin was collected from Nattampatti Virudhunagar district. Two historical sites were located which yielded good number of antiquities of early period and one huge mound was also noticed at Maligaimedu in District Villupuram. Eaithanur very near to Maligaimodu is also another historical site.

19. Megaliths, Mambakkam, District Kanchipuram

S. Krishnamurthy, Senthil Selvakumaran, R. Muthu. C.Santhalingam, Gowthamaputhiran. S.Selvaraj. D. Gopalan and R.Selvaraj under the guidance of A. Abdul Majeed, of the Department of Archaeology, Government of Tamil Nadu, reported the discovery of two megalithic, sarcophagus (148 X 63 X 80 cm) and (56 X 34 X 44 cm), four-legged jar and some iron implements from

an exposed burial at Mambakkam in Sriperumbudur taluk. These were displayed in the pre-historic museum at Poondi

20. INSCRIPTIONS FROM DISTRICTS NORTH ARCOT, NAGAPATTINAM, KANCHIPURAM AND THANJAVUR

The Epigraphy wing of the Department of Archaeology, Government of Tamil Nadu, copied by A.Padmavathi, under the guidance of A.Abdul Majeed, one hundred and sixty inscriptions from various places in the North Arcot, Nagapattinam, Kanchipuram districts, hitherto unnoticed, of which one inscription from Nenmeli is noteworthy. This belongs to the eighth Regnal year of the Pandya King Maravarman Vikrama Pandya of the thirteenth century AD. It records the installation of the deity named Pundarika Nayaka by Kasyapan Kakkunayaga Bhatta *alias* Andar Avudaitevar. It also records the donation of two thousand nine hundred and twenty-two *kuli* of wet land as Thirunamathikkani (tax free *devadana)* to that deity by Tamiladaraiyar of Kalathur. It is significant to note that a new governing body is mentioned in the inscription as "Thamizhadaraiyar". The gift was endorsed and recorded on stone by "Thamiladaraiyars of Kalattur in Kalatturkkottam *(Silalikai Pannikkuduttom Kalattur kkottattu Thamilzhadaraiyarkatom).*

UTTAR PRADESH

21. POTTERY AND ANTIQUITIES, BHATPI, DISTRICT GONDA

Nayan Anand Chakraborty and Sangita Chakraborty of the Lucknow Circle, of the Survey, noticed a large mound (cut across to dig up a canal) in the Bhatpi village on Kharagpur Itiathok Road of the Gonda district which revealed incurved bowls of red, grey and black wares, miniature pot, channel spout, sprinkler, dish, water vessel, pieces of gamesman, designer, a brick-built structure, probably well, etc, of the Kushan period. They also noticed a low mound at Kuri village, 2 km away from the Chacheri Road, P.S. Kamalganj on Lucknow Gonda Road, District Gonda, which revealed grey ware, black-slipped ware and red ware etc.

22. PGW SHERDS, DISTRICTS HATHRAS, ALIGARH, ETAH AND BAREILLY

During the course of exploration of the Centrally Protected Monuments of Agra Circle for compilation of data for Inventory, PGW was noticed at some sites. The sites at which PGW was noticed include Gohana Khera, tehsil Sasni, District Hathras; Bajera Khera, tehsil Akarabad, District Aligarh; Mound at Noh, tehsil Jalesar, District Etah; and a site near Aonla Railway Station, tehsil Aonla in District Bareilly, etc. The sherds were fragmentary in nature. However, a systematic exploration and trial-trench may establish the shapes and typology of PGW at these sites.

23. STONE AGE TOOLS, LAL KAWA NALA, DISTRICT LALITPUR

N. Chakraborty and S.Chakraborty of the Lucknow Circle, of the Survey, identified the Stone Age sites at Lal Kawa Nala, Larela-ka-paura Nala, the slope of the hills between Naharghati and Rajghati Nala, Erai-ka-Nala, Ranchchhorji-ka-Pathar in Lalitpur district. Apart from the stone artefacts, temples of early and late medieval and a few mounds of medieval period have been noticed.

V. MUSEUMS

1. Archaeological Museum, Aihole

The Museum building has been expanded for display of objects. The Gallery 1 was reorganized by providing suitable wooden pedestals with matching Sunmica lamination. The number of displayed objects in the gallery was reduced to twenty-one objects, to avoid over crowding. Amenities for visitors were also provided.

2. Archaeological Museum, Badami

Table-type showcase was provided in Gallery - 2 displaying pre-historic stone objects. The worn-out and damaged plywood and lamination on the door-frames in Gallery-3 were replaced for better appearance. The main wooden door was polished for better look. The miniature models of Durga and Ladkhan Temples were displayed on pedestals in Gallery-1. Vacuum cleaner was procured for removing dust from the sculptures.

3. Orissa State Museum, Bhubaneswar

A beautiful image carved in granite, measuring 86 cm in height and 44 cm in breadth was recovered from the G.R.P. Malkhana, Cuttack, by the Orissa State Museum, Bhubaneswar. The image is four-armed, seated in *lalitasana,* right leg resting on a lotus flower and left leg crossed on the pedestal. The deity holds a *damaru* encircled with serpent coil in the right upper hand. The lower right hand holds a *khapara* and left upper one a trident and lower left a small drinking pot.

This is lavishly ornamented with a *kiritamukuta,* the conical *prabhamandala,* decorated ear studs, necklace and beaded *upavita.* Her thin drapery covers the legs down to the anklets. Five-hooded snake is protecting the image. The sculpture is in excellent state of preservation.

Another image of standing six-headed Karttikeya of Kalachuri period was acquired by the State Museum, from the hill fort of Junagarh (Sambalpur). The peacock as an essential element in the iconography of Karttikeya prominently appears at the back of the image. It is a four-handed image made of red sandstone. The upper right hand holds a trident and the palm of the left lower hand is placed on the peacock. The lower left hand holds an indistinct object while the upper right hand is partially damaged. The figure is ornamented with heavy anklets in the half damaged foot. A big garland *of rudraksha,* encircled round the neck of the deity touches the belly of the image.

4. ARCHAEOLOGICAL MUSEUM, BIJAPUR, DISTRICT BIJAPUR

The defective electric wiring including switches and sockets etc. in Galleries-4,5 and 6 were replaced with new ones. The damaged and worn-out lamination on the pedestals in Galleries-2 and 3 were replaced. The wooden arched-doors and iron grills in Galleries 1,2,3,4,5 and 6 have been painted with matching enamel paint for providing better look and preservation.

5. INDIAN MUSEUM, CALCUTTA

The Archaeological Section of the Indian Museum carried out a number of improvements. A corridor gallery entitled 'Tridhara' was installed in the first floor of the main museum building displaying sculptures of Brahmanical, Buddhist and Jaina pantheons. Renovation and reorganization of the galleries along with regular maintenance were continued. The pre/proto-historic gallery was refurbished and thrown open to the public. Further progress was made by installing sliding door unit on the catwalk of the heavy duty storage system in the alleys of the pre/proto-historic gallery, where small antiquities are preserved.

6. VICTORIA MEMORIAL HALL, CALCUTTA

The Memorial is the repository of largest number of Daniell's paintings in the world. The Memorial's philatelic collection on Indian postal history is equally large. The collections of the Memorial also include Mughal Emperor Aurangzeb's hand-written *Quran,* Dara Shiko's translation of the *Upanishads,* the works of Johann Zoffany, Tilly Kettle, Hodges, Samuel Davis, Robert Home, Reynolds, Charles Doyly, Emily Eden and George Stubb's painting of Hastings, Qazar painting of Fatah Ali Shah, Tipu Sultan's personal war-diary and cannon-balls of the battle of plassey. The memorial possesses the third largest painting in the world-Vassili Verestchagin's "The Procession of the Prince of Wales into Jaipur 1876".

The rich and varied collection housed in the Memorial are being enriched regularly. Setting up of the National Leader's Gallery and collections of other artefacts - Bankim Chandra's writing desk, Mahatma Gandhi's ashes, Jamini Roy's painting signify that. If initial collections were seen as composite representation of empire, the post-independence collection can be termed as quest for Indian Identity albeit national identity.

A unique encapsulated history of three centuries is preserved and displayed in various galleries that attract large number of visitors from all over the country and neighbouring countries of Bangladesh, Nepal, Sri Lanka as well as from Europe and North America.

Apart from the immense treasures possessed, the Memorial has also picturesque gardens that add to the grandiose appeal and create a lasting impression of the Memorial on the mind of the visitors.

The Library of the Memorial, a special reference library, continues to have its emphasis on the Indo-British history of eighteenth-nineteenth centuries and the history of Calcutta. During 1998-99, the Library has enriched its collection by acquiring one hundred and seventy-one books. The rich collection of the Library include George Lyell Collections, Bhabani Charan Law Collection, Prof. D.C. Ganguly Collection, etc.

The Memorial was successful in giving Conservation treatment to two big volumes of the Fleming's Album containing two hundred and ten

water colour drawings, restored two paintings, prepared and supplied two hundred and sixty-four black and white and ninety-four colour transparencies for researchers, scholars and institutions.

During the year under review, the Memorial organized the exhibitions on contemporary paintings, drawings and photographs, besides conducting five seminars.

With a view to promoting art and culture, the Memorial also encouraged' Sit and Draw and Quiz contest, organized by Nikhil Banga Nababarsha Utsav Samity. More than five thousand children participated in the competition. Two other similar events of 'Sit and Draw' and Quiz contest were also organized by two nationalized Bank employees during the year.

7. Government Museum, Chennai

Thirteen bronze antiquities comprising the important bronze icons such as Pradoshamurty, Chandrasekhara, Subrahmanya, Ganesa, Sri Devi, Vishnu were received as treasure trove finds and added to the main archaeological collection of the Government Museum, Chennai.

Sixteen treasure trove objects from various parts of Tamil Nadu, consisting of gold, silver and brass ornaments were received and added to the anthropological collection of the Museum.

Seven treasure trove finds consisting of five-hundred and eighty coins such as south Indian *panams,* Indo British coins, Mysore coins and coins of Nawabs were received and added to the Numismatic collection of the Museum.

Five tribal objects including a wooden vessel and jar, thirty-six geological specimens including multi-coloured granites (Geology), one hundred and fifty-five herbarium specimens including medicinal plants and three cross sections of trunks of trees from Museum campus and thirty-eight zoological specimens were added to the collection of the Government Museum, Chennai. Working models were added to the Children's Museum in Zoological and Geological galleries. Thirteen first day covers were received from the Postal Department. This information was received from the Commissioner of the State Archaeological Museum, Chennai.

8. Maharajadhiraja Lakshmisvara Singh Museum, Darbhanga

The museum has in its possession one ivory image of ten-armed Durga, attended by Ganesa, Karttikeya and *dvarapalas.*

9. Government Museum, Guwahati

During the year, two stone images were collected from Madan Kamdev, Guwahati. The Directorate celebrated the fifty-ninth foundation day of the Assam State Museum. As a part of this, a lecture was delivered by the Minister for Human Resource Development on "Conservation of Wooden Objects and Manuscripts". A new site Museum "Gopinath Bordoloi Memorial Museum" was also inaugurated.

10. Salar Jung Museum, Hyderabad

During the year, the museum expanded its activities by constructing two new wings on either side of the existing building, Eastern and Western Blocks. With the inauguration of European Marble Sculpture Gallery, the Western Block was declared open to the visiting public.

The Western Block has got an auditorium where the educational films, art films, are being screened for the benefit of the visiting public. The Museum

conducted various educational and academic programmes consisting of Special Exhibitions, Seminars, Workshops, Art Camps and Special Lectures and celebrated the Birthday of Salar Jung III, Museum Formation Day and Children's Week, etc. which are its annual features.

The museum invited the general public to take part in its activities to make people aware of the museum movement and to derive benefit of knowing the past, present and future. Special Exhibitions were organized by displaying the reserve collections which is also a regular feature. Besides the Museum organized Inter-State exhibitions, exhibitions on Mobile Van and also arranged visits to public places, educational institutions, etc.

Special exhibitions were held on "Birds and Animals in the Collection of Salar Jung Museum"; "Select Art Objects from Reserve Collection"; "Panorama of Bengal Art"; Art and Drawings done by children below 20 years arranged at Raj Bhavan Darbar Hall, Hyderabad and "Buddhist Artefacts from the Collection of Salar Jung Museum". In this exhibition, Buddhist Art objects represented India, Nepal, Tibet, Burma, China and Japan. Also held was another exhibition on "Contemporary Paintings and Graphics" from the collection of National Gallery of Modern Art, New Delhi and Reflections of Another Day (RAD), Calcutta.

An exhibition on wheel highlighting the Freedom Movement and Emergence of Salar Jung Museum was also organized. This Mobile exhibition was sent to A.P. History Congress held at Hyderabad in the University of Hyderabad.

Special Lecture was organized during the museum week celebration on "Museum is a Centre of Learning" by eminent scholars. The visitors were allowed concessional tickets during this week.

In this year, Museum Week celebrations were held with a Lecture on "Raja Deen Dayal" by a reputed scholar Shehbaz H. Safrani, from New York, USA.

In order to bring out the hidden talents, the museum organizeda 'Summer Art Camp' forthe first time in the museum for the children. A special lecture was organized in this connection on 'Art in Education' by R.W. Deoskar. The students were taught the art of preparing sand models, spray painting, blowing, folding and toy making with grains and seeds, marble paintings, soft toy making, etc.

Another regular feature of the museum activities, comprised various educational programmes, competitions for the students from the twin cities. During the week, the museum was kept open half a day absolutely free for the physically and mentally handicapped children.

A National Seminar on "Jainism, Art, Architecture, Literature and Philosophy" was organized jointly with the Birla Archaeological and Cultural Research Institute, Hyderabad and Osmania University, Hyderabad, during the year.

11. ARCHAEOLOGICAL MUSEUM, LOTHAL

Iron grill gate for safety of the museum building was fixed. A new brass signboard was provided to the main entrance.

12. STATE MUSEUM, LUCKNOW

The museum acquired and duly accessioned the following objects: inscribed clay seal of Gupta period, from Jhansi; copper implements (harpoon, flat and long axes), *c.* 1500 BC, from Jhansi; images of Hindu deities in marble, eighteenth-nineteenth century from Bakshi-Ka-Talab.

13. GOVERNMENT MUSEUM, MATHURA

During the year under review, the museum acquired thirty-six stone sculptures, one terracotta object, one brick, two seals, twelve numbers of pottery, one painting, sixty-six silver coins and fifty copper coins.

The following objects deserve special mention *viz.,* image of Jaina Tirthankara of medieval period (37x30 cm) with Tirthankara images on both sides of the central image. On the pedestal is represented deer very prominently. Upper part of the Tirthankara image contains two elephants on both the sides with *trichhatra* statuette representing Shanti Natha in buff sandstone, acquired through Agra Police (Ace. no. 98.7.4).

Architrave (Ace. no.98.11.4) of a *torana* of the first century AD carved on one side with Buddha, seated on lion throne imparting protection, occupies the centre of the scene. To his left stands five male figures, two figures with bowl and three figures with flowers. On the other side of Buddha are standing figures. The two projecting ends of the architrave are decorated with a fish tailed monster in spotted red sandstone, It was acquired from Maholi village near Ashram of Baba Jai Guradeva, Mathura.

Sculpture (49 X 42 cm) showing Ravananugraha Siva and Parvati (Ace. no. 98.15.4) seated on Nandi. The upper right hand of Siva raised up with flowers and upper left slightly broken, lower right hand enbracing Parvati, seated on Siva's thigh, the right hand of Parvati is placed on the right shoulder of Siva, she holds a mirror in the left. Siva is carved with *jata-mukuta,* headdress of Parvati is composed of high *juda* and she wears usual ornaments. Ganesa on the right side of Siva and Karttikeya on the left side of Parvati are shown. The sculpture belongs to medieval period. Another sculpture showing the bust of (19.5 X 16 cm) Kushan period (Acc. No. 98.17.4), Both hands are broken with well-combed hair and *a juda* on top, *urna* on the forehead, hallow broken from proper left side presenting a smiling face in red sandstone, presented by Dr. Upamanyu, Gandhi Park, Chank Bazar, Mathura.

The museum also acquired a water vessel (dia 82 cm) with auspicious motifs of Kushan period, presented by the Incharge of Police Chauk, Krishna Nagar, Mathura.

14. HAZARDUARI PALACE MUSEUM, MURSHIDABAB

Apart from regular maintenance, anti-termite treatment of the museum galleries as well as of the reserve collection were done regularly to protect the displayed objects and reserve collections. Old record, maps, *farmans,* etc. of the record room were sorted out and arranged in the stacks. Important documents, records, etc. have been kept in the glass fitted almirah in the record room and also in the library.

15. ARCHAEOLOGICAL MUSEUM, OLD GOA

The leaky roof of upper storey was dismantled and repaired. Galleries 6,7 and 8 have been reorganized in a systematic manner after completion of the roof and false ceiling with track lighting system.

The rusted and weak iron grills of windows in the Reserve Collection were replaced with new grills providing a sun shade on the exterior to avoid rain-water.

Three show cases displaying pre and early historic and medieval objects were damaged due to humidity and insect activity. These were replaced with the Novopan board and the exhibits were rearranged with suitable labels, texts, photographs and sketches.

The old and damaged pedestals were replaced with Novopan board and teak wood.

The old electrical alluminium wire was replaced with copper wiring in the Lobby. The walls were painted with fresh OBD.

The list of Portuguese Governors and Viceroys in Goa, were printed in vinyl on two boards and got -4arnmated and displayed on a wall in a prominent place within the portrait gallery. The museum also provided five-extinguishers in the galleries and the reserve collection.

There was a very limited space available for sale counter of departmental publications for which provision for a new spaceous reception-cum-sale counter was made.

16. Archaeological Museum, Ratnagiri

During the year a publication counter at the entrance of the main gate/corridor of the museum building was opened. The Museum galleries were organized by installing the sculptures and antiquities.

17. Archaeological Museum, Ropar

During the period under review, the coin showcase was reorganized to enable the public to access the displayed coins for study. The cultural texts were also highlighted by providing suitable lights.

Lighting arrangements in the Museum were improved by rearranging track-light on the ceiling and tube-lights in the showcases.

Accession register of the displayed antiquities were also prepared. In Gallery 2, blow-ups on monuments of Punjab were displayed. A sale counter for departmental publications was also set up. The World Heritage Week was also celebrated in the Museum by exhibiting photographs of the World Heritage Monuments, Buddhist and Harappan sites in India and important monuments/ sites of the Circle besides conducting an essay and painting competition among the school children.

Generator set was also installed. The galleries were properly painted in light paints. The compound of the Museum was also given facelift by planting flower beds with grassy lawn.

VI. ARCHITECTURAL SURVEY

TEMPLE SURVEY (NORTHERN REGION)

The Temple Survey Project (Northern Region) under K.K. Ramamurthy, conducted the preliminary survey of temples of the pre-Kalinga monuments in Bhubaneswar (Orissa) proper. The Parasuramesvara, Vaital Duel (pl. 94), Muktesvara (pl. 95) and Raja-Rani (pl. 96) Temples were studied. The salient architectural features of these temples are enumerated hereunder.

The Brahmanical architecture of Orissa received momentum during the reign of Sailodbhavas and continued by the Bhaumakaras, Somavamsis, mom the middle of the seventh to eleventh century AD. The temple architecture reached its maturity and standard during the Kalingas from the eleventh century onwards.

The Parasuramesvara is the best example for the development of early phase of temple architecture. Though it had witnessed a large-scale repairs and renovations in the early part of twentieth century, it still preserves the earliest available Jagamohana, *dikpalas* and *sapta-matrikas.* Enclosed within a *prakara,* the temple proper faces westThe *deul* emerging directly from the ground has a squatish *gandi* and *bada.* The rectangular Jagamohana is provided with a terraced roof. *The pabhaga* of the *bada* has three horizontal mouldings, while *ihejangha* has six courses of stone, piled one above the other.

The *bada* is fashioned in *triratha* pattern, provided with framed niches adorning the figures of *salabhanjika* and *mithuna.* The *bhumi* above the niches are once again in *triratha* design. The*paga* is crowned by *vajramastakas* in the form of *chaitya* medallions, which house various divinities. The *gandi* portion is *inpancharatha* plan and well designed with an inward inclination, exhibiting a smooth, gradual convex curve.The *gandi* is surmounted by *mastaka,* consists of *beki, amalaka, khapuri, kalasa* and *ayudha.* The rectangular Jagamohana has entrances on west and south provided with four *gavaksha* and has the terraced roof. The wall portion contains the figures of Arddhanarisvara, Uma-Mahesvara, Hari-Hara, Indra, Yama and Varuna. The door frame of the Jagamohana has the figures of Ganga and Yamuna carved in panels.The *jangha* base contains in niches the figures of Surya, Chandra, Durga, Lakulisa, Siva and *sapta-matrikas* The temple is known for its lavish decoration, more varied cult figures and intricate decorative motifs.

The next stage of architectural development has been noticed at the more refined Vaital Deul Temple. It is a *khakhara* edifice dedicated to the *Sakta* religion, enshrining the Kapalini as presiding deity. The temple is erected on a low *pitha,* with an unfinished Jagamohana. The *bada* is in *triratha* design, while the *pabhaga* constitutes with four mouldings and having *ihepurnaghata* motif at the centre. The lower *baranda* has the *gajamala* at *ikejangha* level. The *raha* portion also has *triratha* design and interestingly, the niches are framed as *gavaksha* and not as a door. The *gandi* has major *vajramastaka* which starts from the

Plate 94



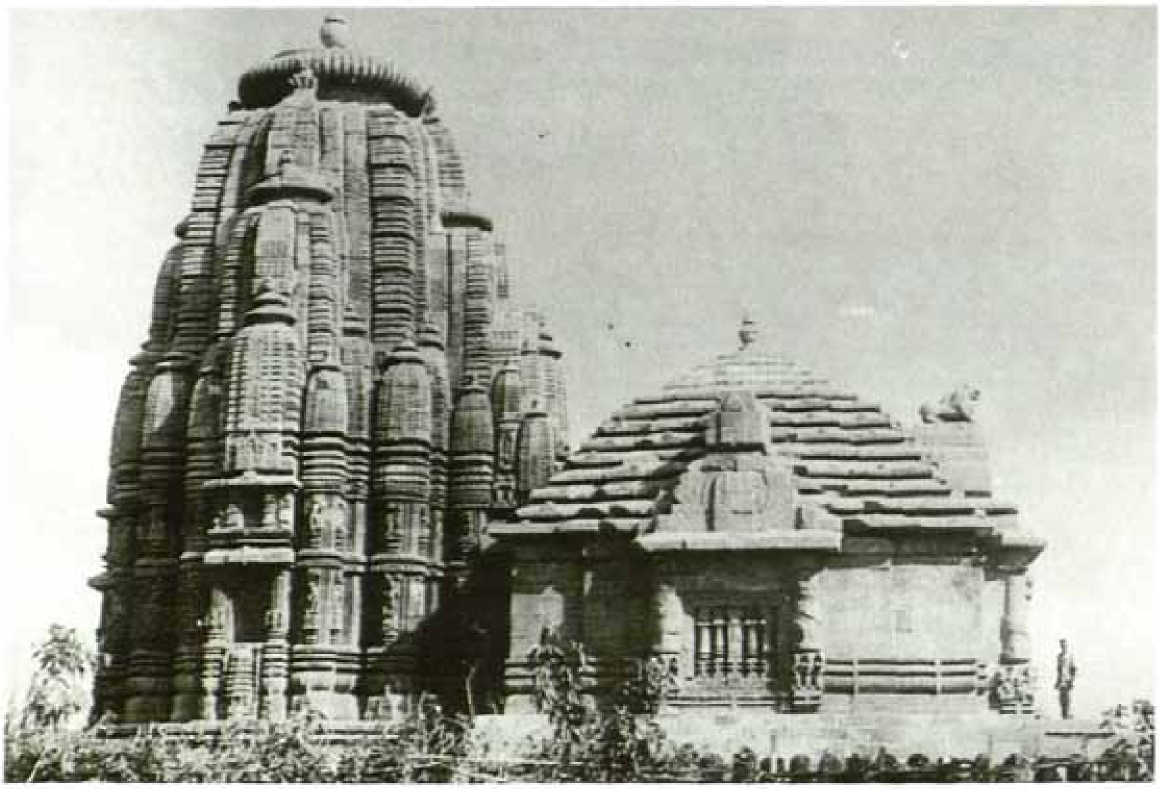
Bhubaneswar, Vaital Deul : general view showing khakharamastaka

Plate 95



Bhubaneswar, Muktesvara : general view with torana entrance

Plate 96



Bhubaneswar, Raja-Rani : general view with jagamohana

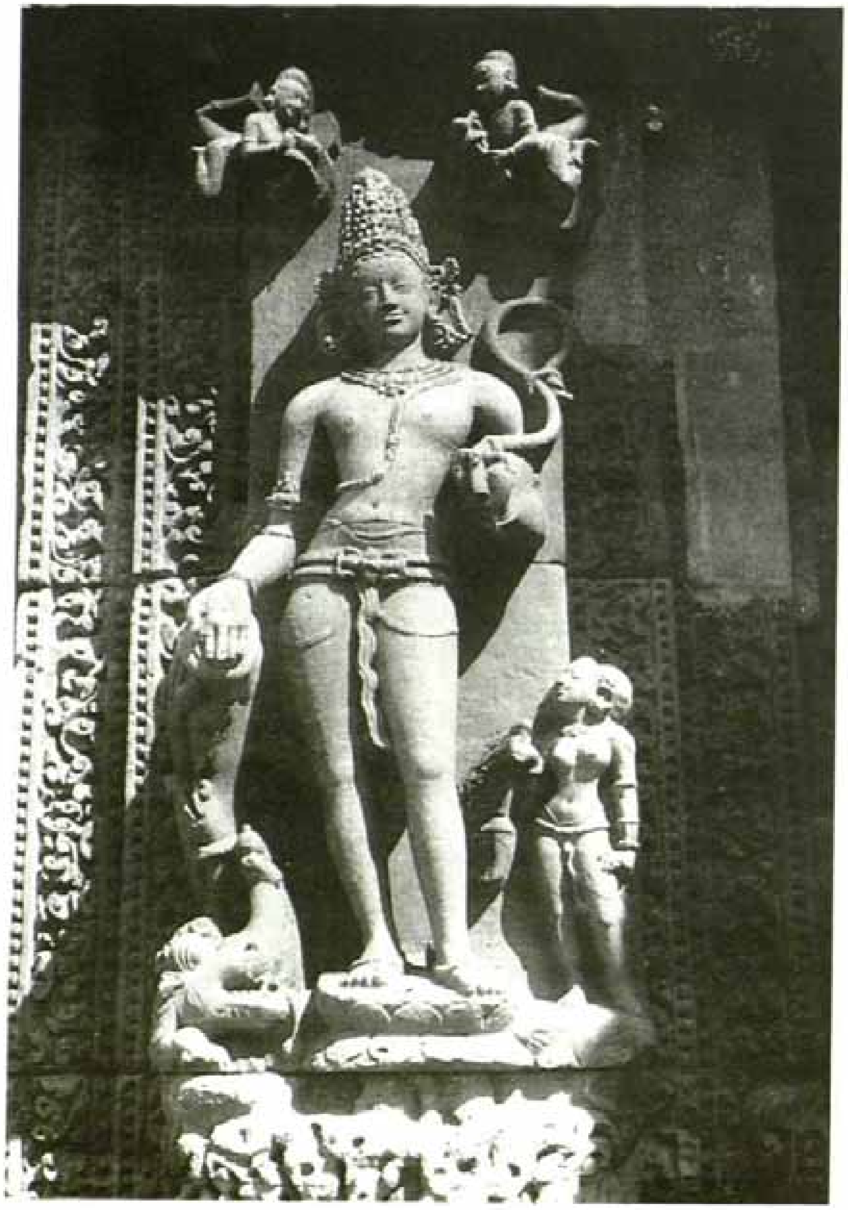
kumbhastambhas. The *baranda* is designed as projection and alternative recess. The east facing *deul* is modelled like an entrance portal, flanked by *kumbhastambhas.* On elevation the *gandi* has the *beki, khakharamastaka, amala, khapuri; kalasa* with *trisula.* The incomplete Jagamohana has the features of diminutive corner *rekha-deul,* anticipating the *panchayatana* concept. The door frame of the *garbhagriha* has the scroll work and *dvarapalikas* at the jamb base. The *purnaghata* pilasters guard the entrance of the Jagamohana. The dark interior of the sanctum houses fifteen images in shallow niches. The notable feature of the temple is the omission of major male gods in *paga* niches and the presence of Mahishamardini and Parvati as *parsvadevatas.* The sanctum images include *ashtamatrikas,* Kubera, *naga* etc., On architectural and stylistic ground this temple could be assigned to the closing years of eighth century AD.

The Muktesvara Temple often described as a 'gem of Orissan architecture' witnessed an integration of new architectural and decorative features. Located within *zprakara,* the temple has a low wall. Within the complex there are many sub-shrines, *kalyani,* a well and *torana.*

The *deul* has a curvilinear *rekha,* and the Jagamohana is provided with stepped pyramidal/?/<i/za roof. On plan the *deul* is *inpancharatha* design. The *kanika* of the *pabhaga* has four mouldings while the *anartha* and *raha* contain five mouldings. The *kanikapaga* of *the jangha* is modelled with pilasters and crowned by *khwra* mouldings. The*pancharatha gandi* is divided by five *bhumis* by the displacement of *bhumi-amalakas* over the *kanika.* The *trianga* design is worked out on the *bada* portion of the *jagamohana.* The *pidha* of the Jagamohana has only *kalasa* and devoid of *amalaka* and *ghanta.* The ceiling of the Jagamohana is designed in coffered pattern and contains the intricately carved *matrikas* seated over lotus petals. The door-frame has the *trisakha* scroll work. The *garbhagriha lalata* has the figure or ga/fl-Lakshmi, surmounted by *navagraha* slab. The external wall of the temple is displayed with numerous *alasakanyas* and female musicians. The *torana* in front has exquisitely carved *makara* arch. The *torana* has *Brahmakanta* base and *Rudrakanta* sixteen fluted shaft. The pillar is crowned by a *vedika, amalaka* and *pushpapotika.*

The Raja-Rani Temple stands in an open area and the *garbhagriha* is without an idol. The temple faces east and erected over *apitha,* consisting of three mouldings. The *pabhaga* has the *khura, kumbha, patti, kani* and *vasanta* mouldings. Though, the *bada* has only *pancharatha* pattern in plan seems to appear as *saptaratha* design. By the application of *madhyabandhana* the *jangha* has been articulated as two-storeyed portion. The noteworthy feature is the depiction of *angasikharas* over the *gandi* portion. The seven mouldings of *baranda* of the structure have been decorated with *angasikharas* at the base of the *gandi.* The *mastaka* portion is surmounted by *amalakas. Saptabhumi* design was followed on the *kanika* over the *angasikharas.* The tall *gandi* is devoid of any figural motif. The square Jagamohana is simply plain and the entrance is flanked by *nagastambhas,* approachable by a *chandrasila* stone. The *lalata* of the Jagamohana has the figure of Lakulisa, indicating the Saivite nature of the temple, originally named as Indresvara. *The jangha* has the figures of standing *ashtadikpalas* in the company of their *vahana* (pl. 97). The temple is also noted for the sculptures of Nataraja, Kalyanasundara and graceful *alasakanyas.* In total, the temple exhibits the trend towards increased height, depiction of figures above the eye level and in addition the introduction of *angasikharas* over the *gandi,* a non-Orissan phenomenon, possible influence of the Central Indian architectural school of thought, a feature common in eleventh century.

Plate 97



Bhubaneswar, Raja-Rani : Varuna on jangha

VII. PRESERVATION OF MONUMENTS

MONUMENTS OF NATIONAL IMPORTANCE

AGRA CIRCLE

UTTAR PRADESH

1. AGRA FORT, AGRA, DISTRICT AGRA

The structure known as Shivaji Cells is located to the north of the Diwan-i-Am-complex inside the fort. The building was cleared off vegetational growth, removing the already accumulated debris and rubbish, dismantling the loose and decayed roof, lime concrete and removal of dismantled materials. The loose and damaged portion was underpinned. After underpinning, 25-40 mm thick plaster was applied after dismantling the decayed plaster.

At the Delhi Gate, the damaged and dead roof concrete was dismantled and removed and relaid with fresh lime-cement concrete. The 25-40 mm thick plaster was provided on the *chhattri* and walls of gate with combination mortar.

At the Diwan-i-Am, the decayed and dead ceiling plaster which was scraped and removed, relaid with 25-40 mm thick plaster with combination mortar. The lime-plaster of the pillars and roof of the complex was also provided where it was found missing.

2. AKBAR'S TOMB, SIKANDARA, DISTRICT AGRA

At the main mausoleum, decayed, broken red sandstone flooring of *dalan* was replaced with the new ones. The decayed and bulged-out plaster on outer facade was removed and re-plastered. A portion of collapsed eastern boundary wall was reconstructed with *lakhauri* brickwork including underpinning and pointing.

3. CHAUBURJ, AGRA, DISTRICT AGRA

The building, which once formed a central edifice of a very huge garden-complex, and *lakhauri* brick core were found bulged and damaged at several places. The loose and damaged *lakhauri* brickwork wherever necessary was restored with underpinning at the eastern, northern and southern parts of the building.

4. CHINI-KA-RAUZA, AGRA, DISTRICT AGRA

At the inner part of the tomb, the lime-plaster in diamond designs and patterns was restored. The damaged plaster on the east and the south facade was also replastered. A compound wall was constructed on east, north and south sides and a gate with M.S. grill gate was provided at the main entrance.

5. GROUP OF MONUMENTS, FATEHPUR SIKRI, DISTRICT AGRA

The collapsed wall located north-east and south of Nagina Masjid was reconstructed with coarse rubble masonry work. The wall was rendered with recessed pointing for further strengthening.

At the Birbal's Palace the old, decayed and damaged red sandstone *chhajja, farandah-stones* with *dasa* and pan design were replaced as per original design and pattern. The *chhajja* stones were finely dressed after table rubbing and the floral pan designs were reproduced on ground itself. At the point of joints of two *chhajjas,* grooves for proper interlocking were provided for additional stability. The joints were also pointed to prevent water seepage. The decayed red sandstone *dasa* stone, 16 cm thick and red sandstone *farandah,* 10 cm thick were also replaced minutely reproducing the geometrical patterns. The work of recessed pointing was also carried out.

At the Jama Masjid, the badly decayed veneering and dab (vertical and horizontal strips) were replaced with new ones as per the original pattern. The damaged and decayed inlay decorations were also replaced with carefully prepared inlay pieces. The ornamental *jali,* 125 mm thick, with hexagonal designs was also replaced with new one after finely dressing and table rubbing.

The development of crack in the marble bracket in the tomb of Sheikh Salim Chishti made the load bearing capacity very weak hence collapsed. The work was done by mending the broken pieces after inserting stainless steel rod.

The double-storeyed pavilion and high wall collapsed due to water seepage causing in structural decay. The western half of the pavilion and the pillared corridor collapsed along with western half of the pavilion. The decorations were also damaged due to collapse of pavilion and wall.

The collapsed wall was raised by properly interlocking the existing wall in the grooves explained above. After reconstructing the wall, it was lime-plastered matching the colour of the adjacent wall. The pavilion was then restored as per the original. After fixing the pillar lintels which project in a perpendicular direction with the wall were fixed in grooves made in the wall and were lime-concreted (pls. 98 -99).

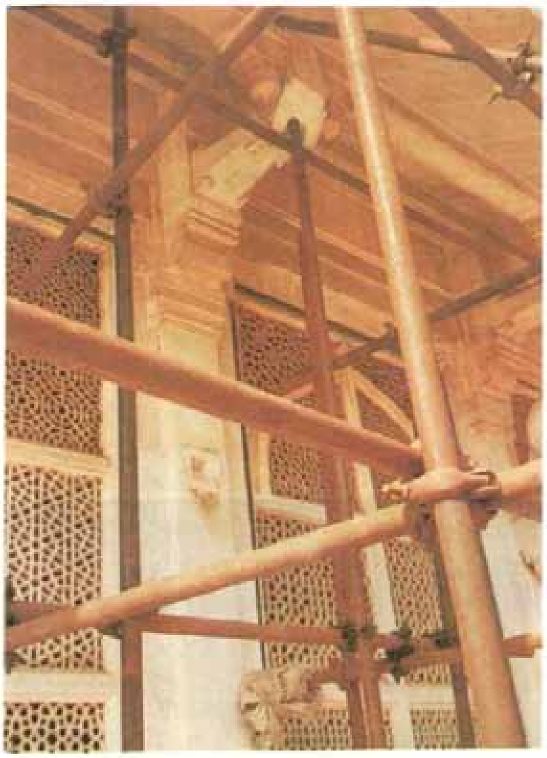
At the four Kos Minars located on the right side of Agra-Fatehpur Sikri Road, the foundation was concreted for fixing mild steel grill all around. The minor repairs in the brickwork, plastering of minars and painting, varnishing work of MS grills were also attended to.

6. ITMAD-UD-DAULA'S TOMB, AGRA, DISTRICT AGRA

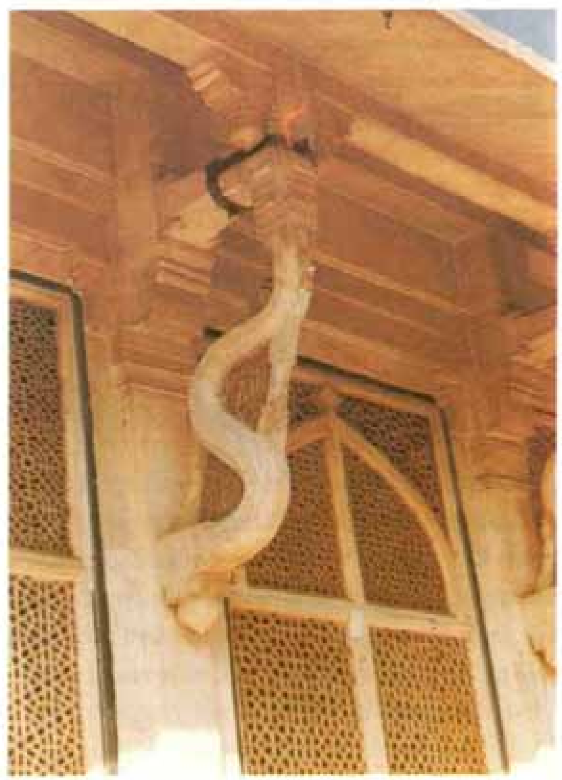
At the riverside *baradari* on the south and west faces decayed and missing inlay pattern in white on red sandstone at several places were replaced in accordance with the original pattern and design. At the south-east corner *burj* a missing red sandstone *chhajja* was replaced with a new one and the *burj* was replastered with lime-plaster on inner and outer sides. Along the platform extending both sides of the river side Baradari, the missing and bulged red sandstone railing and *dasa* stones were also replaced (pls. 100-101).

At the main gate, the red sandstone veneering contains white and black inlay patterns in geometrical designs. However, due to weathering, decay and differential mineral composition of parent and inlaid stones, many of these were either damaged or found missing. These missing inlaid stones were replaced with new ones maintaining the same pattern and design as per the original.

Plates 98-99



98



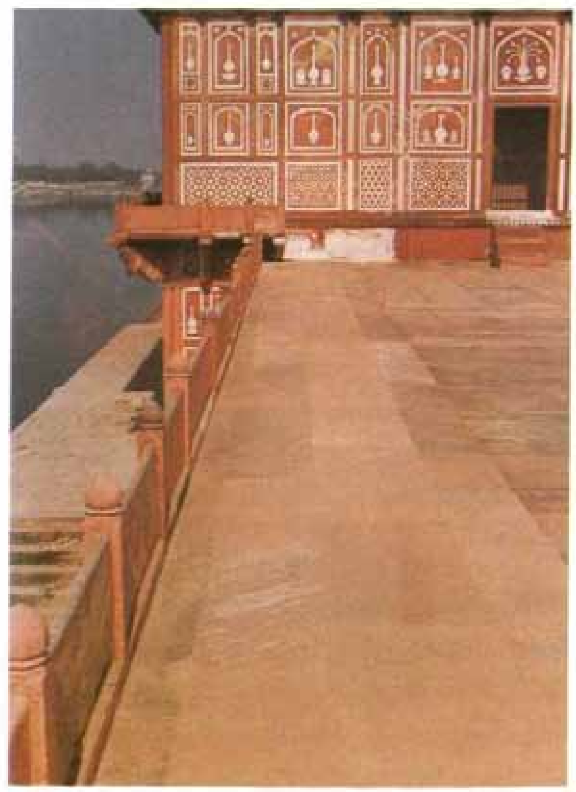
99

Group of Monuments, Fatehpur Sikri, broken pieces of serpentine marble bracket : 98, during and 99, after conservation

Plates 100-101



100



101

Itmad-ud-Daula's Tomb, Agra, red sandstone platform: 100, *before and* 101, *after conservation*

At the main mausoleum, which is one of the precursors of inlaid pattern in Agra has many semiprecious stones inlaid on white marble. The semiprecious stones like jasper, polished limestone, black marble, etc., were fixed in the original architecture. Many of the stones were found missing due to the same reasons explained above. These missing stones were replaced and fixed with special lime-mortar containing traditional ingredients. The facade of the main mausoleum was also water tightened with special lime-mortar. A bulged *chhattri* of the roof, devoid of red sandstone pinnacle was also restored.

The decayed red sandstone flooring in front of the south of the main mausoleum and in front of the west gate were relaid and badly decayed stones were replaced. The pavement was also watertightened with mortar after removing the vegetational growth.

Most of the original stone platforms and pathways of the Charbagh garden were found missing at some places with only the base *of lakhauri* brick platform visible. The missing pathways were reconstructed keeping in alignment the existing pathway and pattern with new and neatly dressed red sandstone. The flag-stones in red sandstone were also provided wherever missing. The pathway was restored after providing a strong base in the form of base concrete. The dwarf wall, which was found missing along the *kachcha* pathway extending from the central grass plot to the west was also reconstructed with tiles and *lakhauri* bricks.

At the north-east corner *burj* and central *burj,* the missing red sandstone pinnacle was replaced with a new one and this *burj* was replastered on its inner and outer sides.

7. JAJAU-KI-SARAI, JAJAU, DISTRICT AGRA

At the fallen portion of the northern wall *lakhauri* brickwork with combination mortar was used. The gateways, rooms and ceiling of verandah of north side gate were plastered. Stained cement pointing on flag-stone flooring of mosque and veneering stones of north side gate was also executed. The roofs and floors were restored with lime-cement mortar and angled frame doors at stairs and entrance of rooms were also provided.

8. MARIAM'S TOMB, SIKANDARA, DISTRICT AGRA

The decayed and peeled off plasterwork on facade of the tomb was replastered. The decayed and damaged roof concrete was relaid with provision of red sandstone pavement wherever it was found missing.

9. TAJ MAHAL, AGRA, DISTRICT AGRA

The garden-complex Khan-e-Alam Bagh is a contemporary structure with Taj Mahal located to its west. It consists of water lifting system in three stages, which is very well preserved here. The fountains in the Charbagh of Taj Mahal are operated through the water tank provided in this garden. The structures inside the garden-complex including tanks, channels, water lifting system, etc., built of *lakhauri* brick, are severely damaged due to overgrowth of vegetation and subsequent dislodging of bricks. The plaster coating of tank, channels also got deteriorated and required restoration. Initially, the vegetational growth with roots over the ancient wall and tank were removed. The loose and decayed plaster, bulged brick walls, etc., were dismantled and removed. *Lakhauri* brickwork was used here with mortar in the ratio of 1:2:3:4 (cement: lime: *surkhi:* coarse sand). The lime-plaster work with moulded plaster, wherever

present over the walls and tank was provided with 40-50 mm thick lime-plaster in the ratio of 1:2:3:4 (cement: lime: *surkhi:* coarse sand). The overhead tank was repaired by carrying out grouting for strengthening the structure and then by triangular concrete *(guna)* work. Fine lime-plaster was applied on the inner side to make the tank watertight and to prevent seepage besides strengthening the ceiling on the inner side of some structures. Due to passage of time and weather action, the lime-concrete roof of the main entrance gate was deteriorated. The red sandstone veneering stones, flooring and marble inlay pieces were also deteriorated at some places due to weather action and decay in the stone itself. The old and decayed lime-concrete of the roof terrace was scraped and removed. A layer of fresh lime-concrete, 25 mm in thickness was laid out with a ratio of 1:1:2: 2 (cement: lime: *surkhi:* coarse sand). The surface was rammed and rubbed and given original colour. At the joining point of wall and floor, triangular concreting *{guna)* was also used. The decayed red sandstone flooring to the east and the west of this gate with geometrical designs and patterns were also restored with same pattern of stone and original designs. The other restoration work carried out in this gateway include replacement of old and decayed red sandstone floral panel on its plinth (pis. 102-103), red sandstone *jali* with hexagonal type of decoration, red sandstone ornamented *galta as* these were all badly defaced due to weathering of red sandstone.

At the main entrance gate, the old and decayed as well as missing white and black marble inlay pieces and bars were replaced with new ones matching the same pattern and design. These marble inlay bars and pieces were prepared in traditional manner by cutting with bow and wire method and then rubbing them on floor for proper shape and fine polishing. The designs and patterns replaced were of octagonal black stone in the form of bangle (7.5 cm in diameter); square-shaped black and white marble (1.5 X 1.5 cm); white marble inlay bars having a section of 15 mm X 20 mm thick, etc.

Missing and broken red sandstone veneering stones at the northeastern *burj* were replaced with the new ones. The *lakhauri* brick patches which were deteriorated were repaired. Special lime-plaster on walls and ceiling was also carried out after carrying out lime-plastering.

At the eastern side of Naubat Khana, the disturbed and out-of-plumb red sandstones were removed and reset. The red sandstones with thickness ranging from 15 to 20 cm were lifted to a height of 5 to 8 m and fixed. Some of the missing and decayed red sandstone veneering stones were also replaced after fine dressing and table rubbed including quid (string) stones.

The terrace of main mausoleum is provided with lime-concrete layer to prevent water seepage. The lime-concrete layer is laid out in fixed dimension .91 m X 2.5m and at the place of joints, thin layer of gap is left for expansion. These joints in course of time deepened and water started to stagnate. The joints and gaps were prepared before applying sealant. They were rendered with straight edges and backer roll is applied at the base of the groove prepared. Then the sealant is applied for finishing and making the colour matched with the adjacent surface. At some places, recessed pointing with suitable pigment was also carried out after preparing the joints.

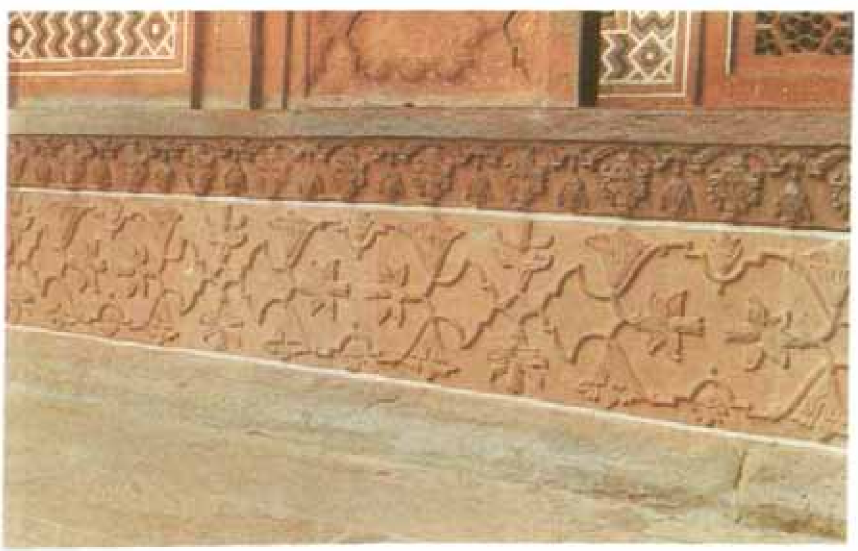
10. BALAPIR'S TOMB, KANNAUJ, DISTRICT KANNAUJ

At the inner gateway, the old, decayed and damaged sandstone veneering stones were reset with new ones along with *kankar/latehte* stone masonry work wherever damaged.

Plates 102-103



102



103

Taj Mahal, Agra, red sandstone ornamental panel : 102, *before* and 103, *after conservation*

The damaged *lakhauri* brickwork adjacent to the outer gateway was also pointed with combination mortar.

At the Balapir's Tomb, the restoration of old and decayed lime-plaster of both intrados and extrados was carried out. The geometrical patterns and designs, which existed originally, were also reproduced.

At the tomb of Mohammad Mehdi adjacent to Balapir's Tomb, the damaged and decayed buff sandstone flooring was restored as per the original and pointed with combination mortar.

AURANGABAD CIRCLE

MAHARASHTRA

11. AJANTA CAVES, AJANTA, DISTRICT AURANGABAD

Construction of retaining walls and parapet walls with G.I. pipe railings in UCRS masonry in cement mortar for widening the pathway from booking office to Caves 4 and 7, was done by excavating, back filling and laying plain cement-concrete over rubble soling and plastering the pathway.

12. DALLATABAD FORT, DAULATABAD, DISTRICT AURANGABAD

During the year, the work of removing thick vegetation, desilting the Sarasvati well and repairs to the undulated broken and missed rim wall was carried out. Laying of pathway in *murrain* from Aamkhas to Princess Hammam including removal of thick vegetation, reconstruction of damaged fallen retaining walls etc (pls. 104-105) were undertaken. The flight of steps near Masjid (Bharatmata Temple) was repaired as per the original. Steel grill gate at Aam-khas and Princess Hammam was installed and the damaged platform cum-roof of the underground cellar near Masjid was repaired.

13. ELLORA CAVES, ELLORA, DISTRICT AURANGABAD

The work of providing retaining wall and parapet wall with G.I. pipe railings in UCR masonry from Caves 5 to 9 for widening the existing narrow pathway is in progress.

14. GHRISNESVARA TEMPLE, ELLORA, DISTRICT AURANGABAD

Reconstruction of damaged and missing portion of the *prakara* wall with proper foundation in concrete was attended to. Removal and resetting of the damaged ancient stone flooring around the temple was done as per the original.

15. GAIMUKHA TEMPLE, LONAR, DISTRICT BULDHANA

The retaining wall in UCRS masonry around the Gaimukha Temple was provided wherever required. Removal and resetting of the undulated and damaged stone flooring and steps around the group of temples at Lonar were executed.

16. LALPETH MONOLITH, CHANDRAPUR, DISTRICT CHANDRAPUR

The construction of compound wall around the protected area was taken up to avoid encroachment and for security measures.The work is in progress.

17. MAHAKALI TEMPLE, CHANDRAPUR, DISTRICT CHANDRAPUR

Plinth protection in stone masonry around the temple, wherever missing, is in progress. Painting in colour snowcem to the outer walls as per the original and white wash inside the temple to clear the black stains were done.

18. PANHALA FORT, PANHALA, DISTRICT KOLHAPUR

Removal of the thick vegetation and wild trees from fort walls with the help of rope ladder, cement

Plates 104-105



104



105

Daulatabad Fort, Aurangabad : wall near Bharatmata Temple: 104, *before and* 105, *after conservation*

concrete flooring inside the Wagh Darwaza, Teen Darwaza, Andhar Bav, Naikinicha Sajja and water tightening the top of the roofs were done.

19. KANHERI CAVES, KANHERI, DISTRICT MUMBAI

Repaired the damaged cement-concrete flooring over ramps and pathway in cement-plaster. Water tightened the roof of visitor's pavilion in cement-plaster. Laid out cement-concrete in front of Caves 2 to 4. Repairs to the damaged *XPMjali* in Cave 3 were taken up. Replaced the damaged hand railing with new one besides construction of dry rubble retaining wall to the either side of iron bridge was also attended to.

20. KONDIVATE CAVES, BORIVALI, DISTRICT MUMBAI.

Irregular pathway was levelled and cement concrete was laid over soling in rubble stone in front of Caves 1 to 10 and 11 to 13 besides M.S. iron grilled gate fixed in front of Caves 11 to 13. Extension of pipe culvert by providing hume pipes and construction of retaining wall in front of Cave 1 in stone masonry and cement mortar were also taken up.

21. PANDAVALENA CAVES, AMBAD, DISTRICT NASIK

Removal and resetting the undulated and missing stone steps, besides providing pathways in cement-concrete were done. Repairs to the store room like replacing the damaged doors and windows with new AC sheet roof etc. were completed.

22. BHAJA CAVES, BHAJA, DISTRICT PUNE

Flight of steps and parapet wall in cement-mortar on either side of the existing pathway including pointing, stone pitching over pathway etc. were provided. Constructed a retaining wall in UCRS masonry in cement-mortar by the side of *nala* for the safety of the visitors.

23. BHULESVARA TEMPLE, MALSIRAS, DISTRICT PUNE

The work of repairs and construction of compound wall around the protected area of the temple is in progress.

24. KARLA CAVES, KARLA, DISTRICT PUNE

Retaining wall in UCRS masonry in cement mortar in front of the main *chaitya* cave for the visitors was provided. Removal and resetting of the damaged flight of steps with old and new stones as per original was taken up and the work is in progress.

25. LANYADRI CAVES, JUNNAR, DISTRICT PUNE

Railing in G.I. pipe was fixed on the either side of the pathway. Removal and resetting of the flight of steps in cement-mortar from booking office to the entrance were taken up. Repairs to the wooden door and windows with *XPMjali* at the main entrance were carried out.

26. PATALESVARA CAVES, PUNE, DISTRICT PUNE

Repaired the damaged compound wall including snowcem painting, welded mesh fixed in M.S. angle iron frame, minor repairs to store room apart from laying cement-concrete with cement-plaster over the existing pathway.

27. SHANIWARWADA, PUNE, DISTRICT PUNE

The work of fixing fresh lathe framed wooden balustrades to the barricade around the Pushkarini and in Nagarkhana is in progress. Repairs to the choked underground drain in stone masonry and the damaged Ganesa Darwaza are in progress.

28. ALIBAG FORT, ALIBAG, DISTRICT RAIGAD

Reconstruction of the fallen breach of the western side fortification wall and repairs to bastions etc., were attended to besides the work of cement-concrete on either side of passage and pointing the compound wall of Siddhivinayaka Temple. M.S. grill gate was fixed at the southern entrance.

29. ELEPHANTA CAVES, GHARAPURI, DISTRICT RAIGAD

Restored the missing facade of Cave 3 in RCC, matching original texture by chiselling and adding colours as per requirement (pis.106-108). Renovation work of custodian quarter, now converted into a Site Museum was completed.

30. JANJIRA FORT, JANJIRA, DISTRICT RAIGAD

Removed thick wild vegetation like *pipal,* Banyan trees, etc. at the northern fort wall and around the tank. Provided stone steps and flooring at the main entrance. Work is in progress.

31. KUDA CAVES, KUDA, DISTRICT RAIGAD

Construction of retaining wall in UCRS masonry in cement-mortar from Caves 1 to 13 was completed. Removal of thick vegetation and providing another retaining wall with parapet in UCRS masonry with cement bedding from Caves 13 to 17 are in progress.

32. RAIGAD FORT, RAIGAD, DISTRICT RAIGAD

Exposed the ancient buried structure by removing debris and pointed. The roof of Jagadisvara Temple and Nagarkhana by was water tightened providing lime-plaster. The repairs to the damaged and missing flight of steps as per original and reconstruction of the damaged wall of Bazarpeth, refixing of collapsed *kalasa* of Shivaji Maharaja Samadhi were undertaken. The missing part in RCC was repaired and applied colour to match the original. Also provided doors and windows to the Hathikhana.

33. SINDHUDIRG FORT, MALVAN, DISTRICT SINDHUDURG

Besides removing thick vegetation from the fort wall, rubble soling in cement-mortar was provided to the main gate of Shivaji Mandir and Mahadeva Mandir. The damaged concrete over the roof at the entrance was watertightened. The work of repairs to the entrance door, desilting the well for portable water and underpinning the foundations of fort wall are in progress.

34. VIJAYADURG FORT, VIJAYADURG, DISTRICT SINDHUDURG

Removal of thick vegetation, debris clearance, filling pits in hard soil, repairs to the stone block were completed. M.S. iron grilled shutters in M.S. angle, iron frame are being provided to the main door, rear door, windows of British guesthouse. The work is in progress.

35. AMBARNATH TEMPLE, AMBARNATH, DISTRICT THANE

Watertightening the roof of the temple by recess pointing the open joints was completed. Resetting the dislodged stones by fixing copper clamps and filling the cracks were done.

BANGALORE CIRCLE

KARNATAKA

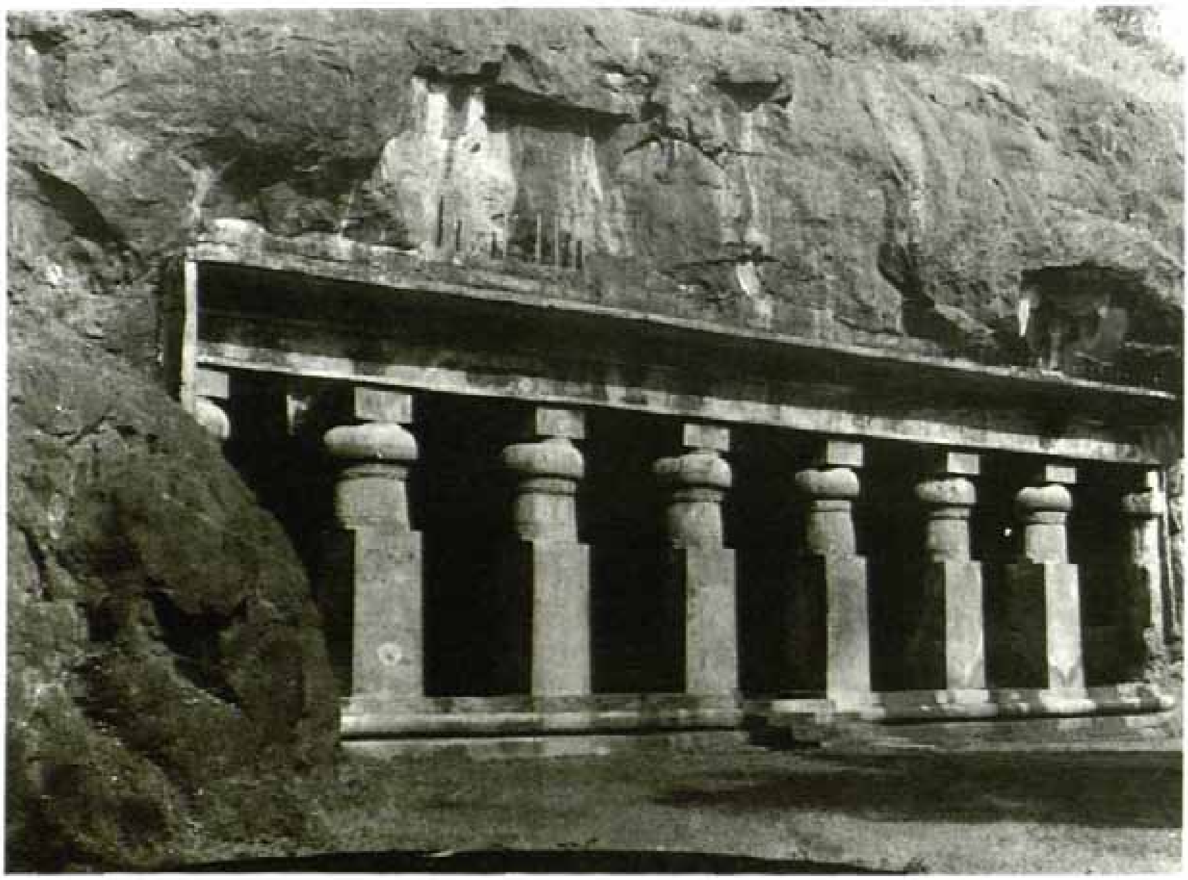
36. FORT, DEVANAHALLI, DISTRICT BANGALORE

Reconstruction of the Cyclopean walls at the western gate was undertaken with available stones including filling of the core with boulders and pointing ofjoints.

37. TIPU SULTAN'S PALACE, BANGALORE, DISTRICT BANGALORE

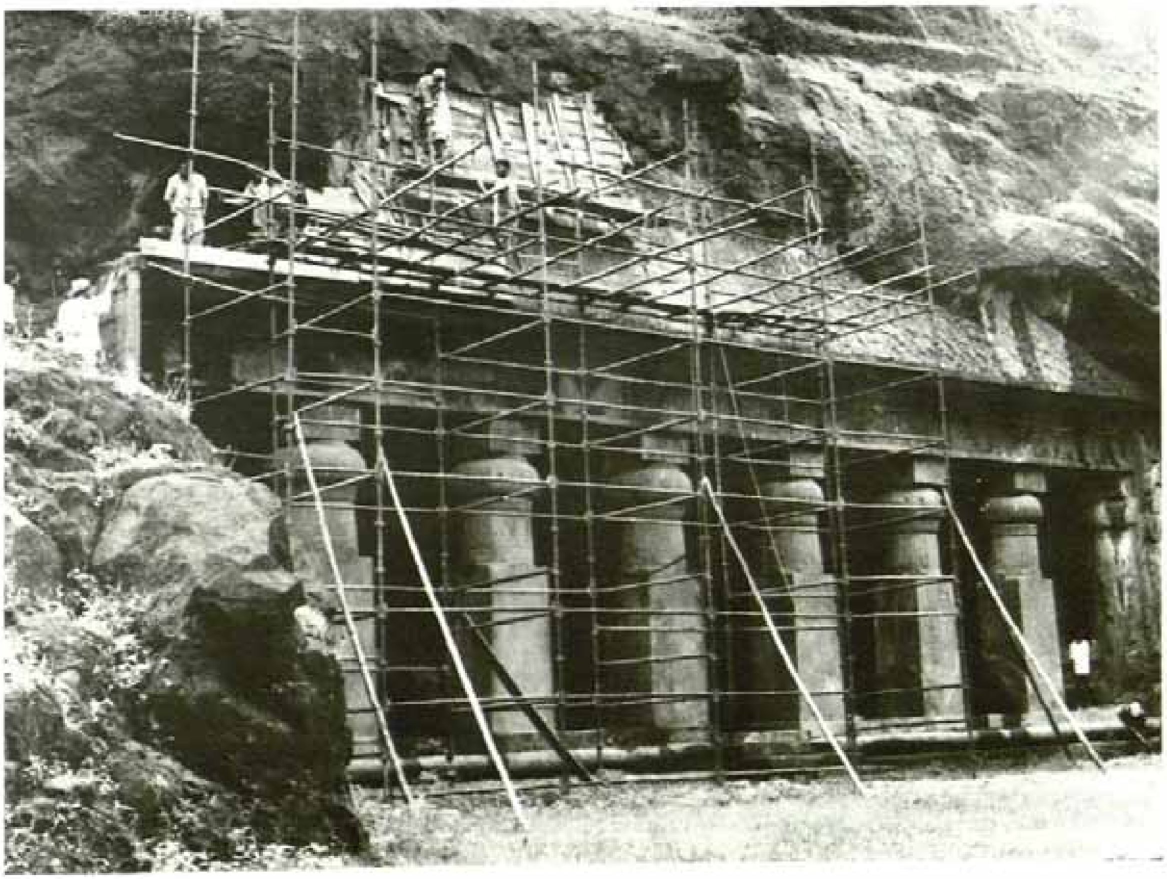
The dead and decayed plaster on the roof was removed and specially prepared mortar was re-laid. Reparis to the balcony on the western side including replacement of wooden planks were undertaken.

Plate 106



Elephanta, Raigad : façade, Cave 3, before conservation

Plate 107



Elephanta, Raigad : façade, Cave 3, during conservation

Plate 108



Elephanta, Raigad : façade, Cave 3, after conservation

Painting of the walls was done applying waterproof cement paint.

38. ACHYUTARAYA TEMPLE, VENKATAPURAM, DISTRICT BELLARY

The Navaranga Mantapa was dismantled right from the top, brick superstructure, *chhajja,* beam, pillar, capitals, etc., masonry support were also dismantled. New granite slabs were provided to the missing roof. Broken beams were consolidated with stainless steel rods fixed in Epoxy base. New granite blocks were provided for capitals, beams etc., wherever missing. The entire structure was reconstructed, and the roof was watertightened (pls. 109-110).

39. ANANTASAYANA TEMPLE, ANANTASAYANAGUDI, DISTRICT BELLARY

The superstructure of the *mandapa* of the main entrance was dismantled. New beams, capitals etc., were provided in place of missing stones and reconstructed after core filling with brick and lime mortar and waterproof cement mixed with lime and brickbats was relayed afresh (pls. 111-112).

40. ASOKAN INSCRIPTION, NITTUR, DISTRICT BELLARY

Besides constructing a small Mantapa shelter, cement-concrete bed was provided for foundation and new granite stone pillars, beams, capitals, roof slabs were fixed. The roof was provided with weatherproof course.

41. CHANDRASEKHARA TEMPLE, KAMALAPURA, DISTRICT BELLARY

Fresh stone veneering was provided to the compound wall after filling the inner core and dismantling the rubble stone masonry support.

42. GANESA MANTAPA, MUSEUM PREMISES, KAMALAPURA, DISTRICT BELLARY

The Ganesa Mantapa with its pillars, beams, capitals and roof slab was dismantled. The plinth portion was removed. New earth work excavation was undertaken and foundation was laid in cement concrete and rubble stones. The entire structure was reconstructed.

43. GROUP OF JAINA TEMPLES ON HEMAKUTA HILL, HAMPI, DISTRICT BELLARY

The fallen enclosure wall on south-east corner entrance and enclosure wall on the western side was reconstructed, after filling the core in rubble.

44. KALLESVARA TEMPLE, AMBALI, DISTRICT BELLARY

The existing compound wall was demolished. The protected area was extended and a dwarf compound wall was constructed with crimped mesh provided above.

45. KALLESVARA TEMPLE, HIREHADAGALI, DISTRICT BELLARY

The basement all around the sub-shrine of the Suryanarayana Temple was exposed, the missing stones were provided as per original and replaced, the core is filled with rubble and stone jelly. The stone walls covering the Nandi Mantapa were removed to restore the original feature.

46. KRISHNA TEMPLE, KRISHNAPURA, DISTRICT BELLARY

The stucco figures on the Mahadvara were mended with plaster of Paris gelotin rubber with oil etc., as per original.

Plates 109-110



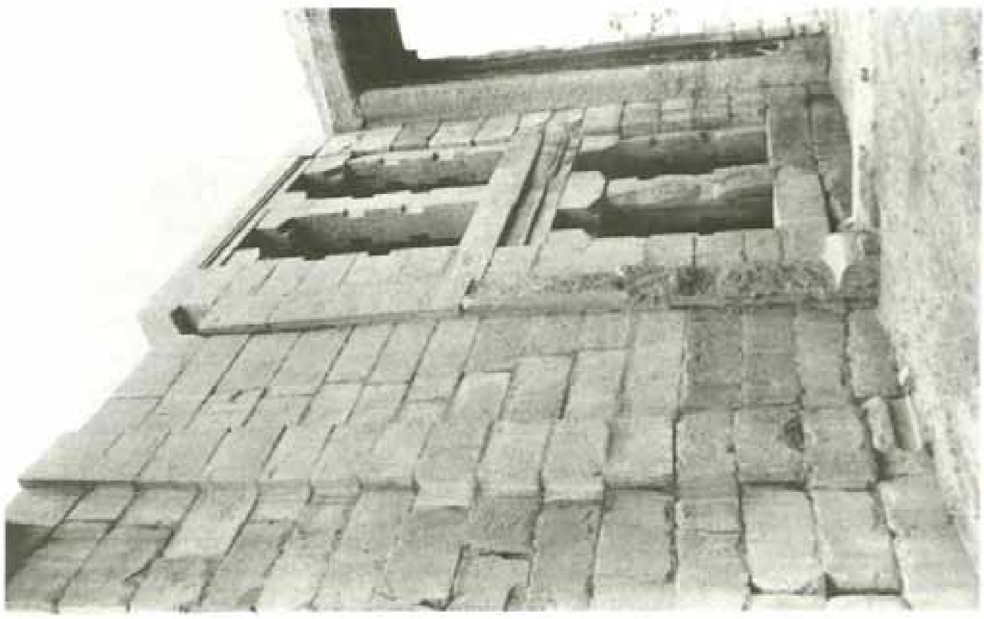
109



110

Achyutaraya Temple, Venkatapura : 109, *before and* 110, *after conservation*

Plates 111-112



112



111

Anantasayana Temple, Anantasayanagudi : 111. *before and* 112. *after conservation*

47. MAHANAVAMI DIBBA, HAMPI, DISTRICT BELLARY

The stone veneering was dismantled and fresh stones were provided wherever missing and set in lime-mortar. The top of the Mahanavami Dibba was excavated to study the plan and placement of pillar bases etc. Fresh granite stones were provided to the pavement and ornamental members were fixed to the original position.

48. MULA VLRUPAKSHA TEMPLE, HAMPI, DISTRICT BELLARY

The dead and decayed mortar over the roof of the *mukha-mandapa* was removed. Architectural members like parapet counter weight *chhajja,* beam's capitals, pillars etc., were dismantled and reconstructed. The ugly looking rubble walls were removed (pls. 113-114).

49. MUSEUM BUILDING, KAMALAPURA, DISTRICT BELLARY

The dead and decayed cement, lime-concrete were scraped, chiselled and removed. A layer of cement-concrete was laid over which a layer of fine plaster was provided as a waterproof course.

The roof of the cloister *mandapa* of the southern side of the main entrance was completely cleaned and dead mortar removed. Several architectural members like roof slabs, capital, beams etc., were dismantled and reconstructed. New granite beams and roof slabs were provided wherever original ones are missing or broken and the roof was watertightened.

50. ZA.NA.NA ENCLOSURE, KAMALAPURA, DISTRICT BELLARY

The enclosure wall was reconstructed wherever fallen, dismantled or missing with available stones after filling the core with boulders and lime-mortar.

51. VITTHALA TEMPLE, VENKATAPURA, DISTRICT BELLARY

The highly ornamental architectural members of the *mukha-mandapa* was carefully dismantled and the dead waterproof course of the roof removed, for subsequent repairs.

52. VIJAYANARAYANA TEMPLE, GUNDLUPETE, DISTRICT CHAMARAJA NAGAR

The dislodged and out-of-plumb architectural members of the *antarala* were dismantled and reset as per original. The badly damaged brick masonry *vimana* was strengthened and replastered. The accretionary brick wall to the left of the main hall was dismantled and the surroundings are kept presentable.

53. AMRUTESVARA TEMPLE, AMRUTAPURA, DISTRICT CHIKMAGALUR

The dislodged architectural members of the outer veneering wall ofNavaranga of Amrutesvara Temple were dismantled and reconstructed.

54. VIRANARAYANA TEMPLE, DISTRICT CHIKMAGALUR

The crimped mesh fencing was provided around the monument.

55. FORT, CHITRADURGA, DISTRICT CHITRADURGA

Retaining wall was constructed between the three entrances III , IV and V. Fallen portion of the fortification wall was reconstructed near Burujanahatti and behind Garebagilu.

56. FORT AND LARGE MASONRY ELEPHANT, MARCERA, DISTRICT COORG (KODAGU)

The brick parapet wall of the fort on the southern and western sides was cleared of vegetation and dead plaster. Missing brick masonry wall was reconstructed and plastered wherever necessary.

Plates 113-114



113



114

Mula Virupaksha Temple, Hampi : 113, *before and* 114, *after conservation*

57. RAJA'S SEAT, MERCERA, DISTRICT COORG (KODAGU)

Mild steel grill and gate was provided around the structure.

The main *gopura* and parapet wall were provided with colour wash. Roof of the *mukha-mandapa* (eastern side) was repaired by removing dead plaster and watertightened by applying a thick coat of waterproof compound.

58. FORT AND RUINED PALACE, UCCHANGIDURGA, DISTRICT DAVANAGERE

Debris clearance was undertaken in the palace rooms, Magazine, toilet blocks etc., and reconstruction of palace and fort wall was also undertaken. Debris and jungle clearance on both sides of Raja street were completed thus exposing the side walls and moulded basement of the street.

59. SCULPTURE SHED, BAGALI, DISTRICT DAVANAGERE

Loose sculptures were installed on the new newly constructed pedestals. In the Sculpture Shed electrification and grills to the windows for security purposes were provided.

60. MAHA STUPA, SANNATI, DISTRICT GULBARGA

The work of mending large architectural fragments is in progress by drilling holes and inserting non-corrosive stainless steel rods with Epoxy resin as adhesive.

61. FORT AND DUNGEONS, MANJIRABAD, DISTRICT HASSAN

An iron gate was provided and fixed to the entrance of the fort.

62. JAINA BASADI, HALEBID, DISTRICT HASSAN

The outer veneering wall on the eastern side of the Shantinatha Basadi was dismantled and reconstructed.

63. ANCIENT PALACE SITE, SRIRANGAPATNA, DISTRICT MANDYA

Exposed mud wall was plastered with matching colour as per the original besides constructing a brick compound wall on the southern side of the site. Scientific debri clearance was undertaken and palace structures were exposed including a hall with pillar bases, corridor, water outlet, drains etc.

64. DARIA DAULAT BAGH, SRIRANGAPATNA, DISTRICT MANDYA

Cement-concrete was laid to the pathways of Summer Palace of Tipu Sultan and by the side of Nagarkhana after excavating and levelling the earth.

65. GUMBAZ, SRIRANGAPATNA, DISTRICT MANDYA

Wooden barricade was fixed around the tombs inside the Gumbaz. New clay tiles were fixed in the verandah as per the original besides a coat of cement paint was applied to the outer surface of the Gumbaz for protection.

66. JUMMA MASJID, SRIRANGAPATNA, DISTRICT MANDYA

The roof was completely plastered in waterproof compound and watertightened. Construction of new water tank was taken up and repairs were done to the old water tank by replastering the surface.

67. NARAYANASVAMY TEMPLE, MELKOTE, DISTRICT MANDYA

New electrical fittings were provided after removing the old ones. A collapsible gate to the

Lakshmi Shrine was provided besides repairs to Mahadvara, and the parapet wall.

68. OBELISK, SRIRANCAPATNA, DISTRICT MANDYA

Approach road was cleared of vegetation and the earth levelled. The brick parapet wall on western and northern sides was strengthened by plastering and repairing the missing portions.

69. KIRTINARAYANA TEMPLE, TALAKAD, DISTRICT MYSORE

Out-of-plumb and dislodged architectural members of the Mahadvara of this temple was dismantled after proper documentation for reconstruction.

70. SRIKANTESVARA TEMPLE, NANJANGUD, DISTRICT MYSORE

The old decayed scantlings of the *chikka-gopura* were carefully removed and replaced by new 5a/ wood members for strengthening the *gopura.*

71. AGHORESVARA TEMPLE, IKKERI, DISTRICT SHIMOGA

The *sikhara* and the roof were rendered leak proof by providing a slope by relaying lime-mortar and sealing of the joint. Missing portions of *iheprakara* walls were reconstructed as per the original.

72. RAMESVARA TEMPLE, KELADI, DISTRICT SHIMOGA

Roof of the Ramesvara Temple was replastered in lime-mortar after removing the dead plaster.

73. RENLKAMBA TEMPLE, CHANDRAGLTTI, DISTRICT SHIMOGA

The leaky-roof of the temple was repaired after laying *surkhi* and plaster. Plinth protection course was provided in front of the temple by laying of granite slabs. At the edge of the platform G.I. pipe railing was provided. Damaged wooden frames between the *kakshasana* roof were repaired and painted.

74. TRIPURANTESVARA TEMPLE, BELLIGAVI, DISTRICT SHIMOGA

Plinth protection around the temple was undertaken by laying granite stone slabs besides laying matching schist stones on the top course of the *adhishthana* platform.

75. KEDARESVARA TEMPLE, NAGALAPURA, DISTRICT TUMKUR

Stone pavement was provided around the platform of the temple andjoints pointed to stop water percolation.

76. ANANTAPADMANABHA TEMPLE, KARKALA, DISTRICT UDUPI

Stone slab was provided around the pavement of the main shrine.

BHOPAL CIRCLE

MADHYA PRADESH

77. BARADARI-COMPLEX, ATER FORT, DISTRICT BIIINI)

In continuation of the last year's work (7997-*98,* p. 274), clearance of settled debris and collection of architectural fragment of Baradari at the site was taken up. The work is under progress.

78. PALACE-COMPLEX, ATER FORT, DISTRICT BHIND

Clearance of settled debris and collection of architectural fragments at the site, conservation of

gates with terracotta *lakhauri* bricks in *ms-surkhi* mortar matching the original were done.

79. KAMALAPATI PALACE, BHOPAL, DISTRICT BHOPAL

Watertightening of terrace and replacement of damaged door with new ones were done.

80. CHITRAGUPTA TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR

Dismantling of the dwarf wall along with M.S. grill and providing entrance gate in C.R. stone masonry besides *murran* road from Chitragupta to the new entrance gate were taken up. Laying of lime-concrete on the floor and apron of platform, levelling and dressing of stones are in progress.

81. LAKSHMANA TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR

In continuation of the last year's work *(1997-98,* p.275), stone block masonry work *upto jagati* platform with available original stone blocks in the sub-shrine was completed and the work above *jagati* platform, ashlar work of pillars, door-jamb and veneering stones and fixing loose sculptures with copper clamp is in progress.

82. VAMANA TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR

In continuation of the last year's work *(1997-98,* p. 275), replacement of barbed-wire by C.R. stone, dwarf wall with cement-mortar and mounted with the painted M.S. grill was completed.

83. WESTERN GROUP OF TEMPLES, KHAJURAHO, DISTRICT CHHATARPUR

Clearing of debris behind the Lakshmana Temple and arranging fragments in systematic way were completed. Repairing of two *samadhis,* approach road, providing entrance gate, C.R. masonry and paints etc., were undertaken.

Reconditioning of the flood and security lights of the temple and Baoli was completed applying snowcem to the outer face of the Museum building and applying sandstone colour to the G.I. sheet, grills, shelter and angle iron posts of the museum building and Jardine Museum were completed. Cultural text and notice boards were also replaced with new ones.

84. CAVE 7, BAGH, DISTRICT DHAR

In continuation of the last year *(1997-98,* p. 275), the work of laying the R.C.C. slab in Cave 7 to erect false ceiling and support to rock is in progress. Dismantling of decayed and damaged rock-cut pillars of Cave 2 and reconstruction of R.C.C. pillar matching the rock finishing were completed.

85. SIVA TEMPLE, SAKOR, DISTRICT DAMOH

Replacement of barbed-wire fencing by providing dwarf wall of C.R. stone masonry, mounted with barbed-wire fencing with angle iron posts with matching painting and debris clearance were taken up.

86. GROUP OF MONUMENTS, MANDU, DISTRICT DHAR

Construction of boundary wall around Nilakanthesvara Temple mounted with M.S. grill and reconditioning of approach road were done.

87. EXCAVATED SITE, PAWAYA, DISTRICT GWALIOR

Restoration of damaged boundary wall with available original stones in lime-mortar was done.

88. TELI-KA-MANDIR, GWALIOR FORT, DISTRICT GWALIOR

In continuation of the last year's work *(1997-98,* p. 276). raising the level of platform, providing M.S. grill over boundary wall and providing stone slab flooring were completed.

89. TOMB OF MOHAMMAD GHAUS AND TANSEN'S COMPLEX, GWALIOR, DISTRICT GWALIOR

Reconditioning of approach road leading to the tomb with stone slab flooring over lime-concrete is in progress.

In continuation of the earlier work *(1996-97,* p.254) providing and fixing stone *jalis* in the Hujras and dismantling ofbroken stone *chhajja* and providing new *chhajjas* and facing stones of the Hujjra and mounting of M.S. grill over the compound wall to check the entry of unsocial elements, laying of new lawn near mosque and to the rear of Tansen Tomb besides clearance of settled debris were completed.

90. MADAN MAHAL, JABALPUR, DISTRICT JABALPUR

Restoration of structures with available stones in lime-mortar was completed.

91. MAMLESVARA TEMPLE, MANDHATA, DISTRICT KHANDWA

M.S. grill over compound wall for security purpose was mounted.

92. SIDHNATHA TEMPLE, MANDHATA, DISTRICT KHANDWA

Collection of stone beams and fixing over verandah pillars and repairs to the stones and filling of gaps with stone masonry were done.

93. BEGAM MAHAL, RAM NAGAR, DISTRICT MANDLA

Clearance of settled debris and restoration of damaged boundary wall was carried out with available original stones in lime-mortar.

94. EKTARSO MAHADEO TEMPLE, MITAWALI, DISTRICT MORENA

Treatment of approach path with flat stone laid on cement-concrete base for easy movement of the tourist was taken up.

Cement-concrete in base of stone slab flooring around the periphery of the temple was provided for strengthening the foundation. Restoration of damaged circular walls of Mahadeo Temple is in progress.

95. GARHI, PADAWALI, DISTRICT MORENA

Reconditioning of approach path leading to the temple by laying stone slab flooring over cement concrete base is in progress for easy movement of tourists.

The buldged and out-of-plumb walls and missing portion of western bastion were restored by exposing the bastion wall and the work was completed.

Provided tubewell for developing the environment and garden. Restoration of bastion Nos. 2,3, and 4 was also attended to.

96. GROUP OF TEMPLES, BATESHVAR, DISTRICT MORENA

Resetting and restoration of the *Mandapika* Shrines with available architectural members is in progress.

97. GROUP OF MONUMENTS, NARESHVAR, DISTRICT MORENA

Treatment of approach road for easy movement of the visitors and construction of dry stone masonry boundary wall to check the entry of animals and unsocial elements are in progress.

98. CHAUBARA DERA NO. 2, OON, DISTRICT NIMAR

Restoration of *jagati* platform with stone blocks in lime-mortar is in progress.

99. IDGAH, ASIRGARH, DISTRICT NIMAR

Filling up of foundation and plinth with R.R. stone masonry in lime-mortar and providing *lime-surkhi* plaster matching the original were done.

100. COMPOUND WALL, SANCHI, DISTRICT RAISEN

In continuation of the last year's work *(1997-98,* p. 278), replacement of barbed-wire fencing by providing C.R. stone masonry and dwarf wall mounted with M.S. grill is in progress.

101. GROUP OF MONUMENTS, SANCHI, DISTRICT RAISEN

The terrace Structure 44 was watertightened besides the bulged and out-of-plumb structure of apsidal temple which is in progress.

102. FORT, RAISEN, DISTRICT RAISEN

Restoration of wall of Badal Mahal and Rani Mahal with stone masonry in lime-mortar with original available stones, matching the original is in progress.

103. MADIGHAT, BARHAT, DISTRICT RAISEN

Clearance of settled debris and reconstruction of stupas with original stones, layerwise are in progress.

104. ROCK-SHELTER AND PAINTING, BHIMBETKA, DISTRICT RAISEN

Laying of cement-concrete and filling of cavities with rubbles for easy movement of visitors were done besides providing bench for the visitors.

105. SIVA TEMPLE, BHOJPUR, DISTRICT RAISEN

In continuation of the last year's work *(1997-98,* p. 278), scooping out of large-size cut stone block and dressing for ceiling work of the temple are in progress.

106. STUPAS, MUREL KHURD, DISTRICT RAISEN

Clearance of settled debris, conservation and part restoration of the stone stupa with dry stone masonry and original available stones are in progress.

107. SIVA TEMPLE, MANDI BAMORA, DISTRICT SAGAR

In continuation of the last year's work *(1997-98,* p. 278-279), replacement of G.I. barbed-wire fencing with C. R. stone masonry, dwarf wall in lime-*surkhi* mortar and mounted with painted M.S. grill were taken up.

108. SIVA TEMPLE, BHUMARA, DISTRICT SATNA

Flag-stone flooring over base of lime was provided.

109. STUPAS, PANGURARIA, DISTRICT SEHORE

In continuation of the last year's work *(1997-98,* p. 278) restoration of stone stupas with dry stone of masonry, as per original, was done.

110. HINDOLA TORAN, GYARASPUR, DISTRICT VIDISHA

Treatment of approach path by providing stone slab laid over cement-concrete and providing stone

edging on both the sides for easy movement of visitors are in progress.

111. SAPTA-MATRIKA CAVE, BADOH PATHARI, DISTRICT VIDISHA

Demarcating and fencing the area with angle iron posts with barbed-wire fencing was completed.

BHUBANESWAR CIRCLE

CHHATTISGARH

112. LAKSHMANESVARA TEMPLE, SIRPUR, DISTRICT MAHASAMUND

Construction and widening of existing apron around the temple to facilitate visitors movement is in progress.

113. TEMPLES AT NARAYANPUR, DISTRICT RAIPUR

An enclosure wall was built within the premises of Mahadeva Temple and Sheorinarayana for security against theft/vandalism ofloose sculptures laying inside. The work is in progress.

ORISSA

114. BARABATI FORT, CUTTACK, DISTRICT CUTTACK

Restoration of citadel wall of the Barabati fort was taken up. The work of outer fortification wall with the dressed laterite stone is in progress. Damaged and worn-out stones were replaced by new stones.

115. EXCAVATED SITE, LALITAGIRI, DISTRICT CUTTACK

Conservation and restoration of the Monastery 4 were resumed and the work is in progress. The eastern and northern portion of the excavated monastery is currently under conservation.

116. KEDARESVARA TEMPLE, CHOUDVAR FORT, DISTRICT CUTTACK

In continuation of the previous year's work *(1997-98,* p. 280), restoration of the temple from upper *jangha* to verandah level was successfully completed following the archaeological norms and principles. In addition to this, pointing work was also done in the main Vimana along with iron girder. Support was also provided to the broken door lintel of the temple (pls. 115-116).

117. EXCAVATED SITE, UDAVGIRI, DISTRICT JAJPUR

The Monastery 2 (currently under excavation) was taken up for simultaneous conservation in order to save it from further deterioration, in the wake of archaeological spadework. Accordingly, necessary conservation measures are being adopted by means of restoration of wall of the sanctum, cells and monastery and by providing buttresses etc. The out-of-plumb/damaged bricks of the structure were removed and reset as per original (pls. 117-118).

118. BAKRESVARA TEMPLE, BHUBANESWAR, DISTRICT KHURDA

Stone blocks of undulated pavement inside the temple-complex were removed. Pointing work of *pidha* roof of Jagamohana was also attended to.

119. LINGARAJA TEMPLE, BHUBANESWAR, DISTRICT KHURDA

Three small dilapidated sub-shrines, namely Ramalingesvara, Lavanesvara and Ladukesvara within the temple premises, were dismantled for reconstruction. Subsequently, the restoration work of the aforesaid shrine were successfully completed one after the other.

Plates 115-116



115



116

Kedaresvara Temple, Chaudwar : 115, *before and* 116, *after restoration*

Plates 117-118



117



118

Excavated Monastery No. 2, Udaygiri : 117, *before and* 118, *after excavation*

120. NAVAKISHORE TEMPLE, BHUBANESWAR, DISTRICT KHURDA

Conservation and reconstruction of missing laterite stone wall along the periphery of ancient tank in front of the temple was taken up. The damaged laterite steps of the aforesaid tank was also conserved. The work is in progress.

121. RAMESVARA TEMPLE, BHUBANESWAR, DISTRICT KHURDA

In continuation of the previous year's work *(1997-98,* p. 280), the dwarf wall on the northern and eastern sides was constructed.

122. YAMESVARA TEMPLE, BHUBANESWAR, DISTRICT KHURDA

The undulated pavement was relaid besides painting of *ihsprachi* (enclosure) wall. Dressing and cutting of the sandstone blocks for restoration of damaged Vimana and Jagamohana of the temple are in progress.

123. FORT, HARIPURGARH, DISTRICT MAYURBHANI

Construction of laterite dwarf wall around the site (west) of the fortification is in progress.

124. DAKSHYA PRAJAPATI TEMPLE, BANAPUR, DISTRICT PURI

In continuation of the previous year's work *(1997-98,* p. 281), dismantling and resetting of out-of-plumb eastern and southern *rahapaga* upto *bisama* and *beki* portion was successfully done. Disintegrated and broken stone blocks of niches in cardinal direction of the exterior were also replaced by the new ones in the sanctum.

125. JAGANNATHA TEMPLE, PLRI, DISTRICT PURI

In continuation of the previous year's *(1997-98,* p. 281) work, the restoration and resetting of loose/missing battlement stone of southern side of *kurmibeda* was attended to. A coat of lime-cement-plaster was applied over the battlement.

Removal of dead lime-plaster from the northern side of *kurmibeda* was also completed. Some dislodged and out-of-plumb stones of the *kurmibeda* (northside) were repaired and reset as per the original.

CHANDIGARH CIRCLE

HARYANA

126. SURAJKUND, FARIDABAD, DISTRICT FARIDABAD

The repairs to the stone masonry retaining walls and steps on the northern side of the *kundwere* taken up and completed. The compound wall on the north side was also extended. The repairs to the *gau ghat* was also taken up and completed.

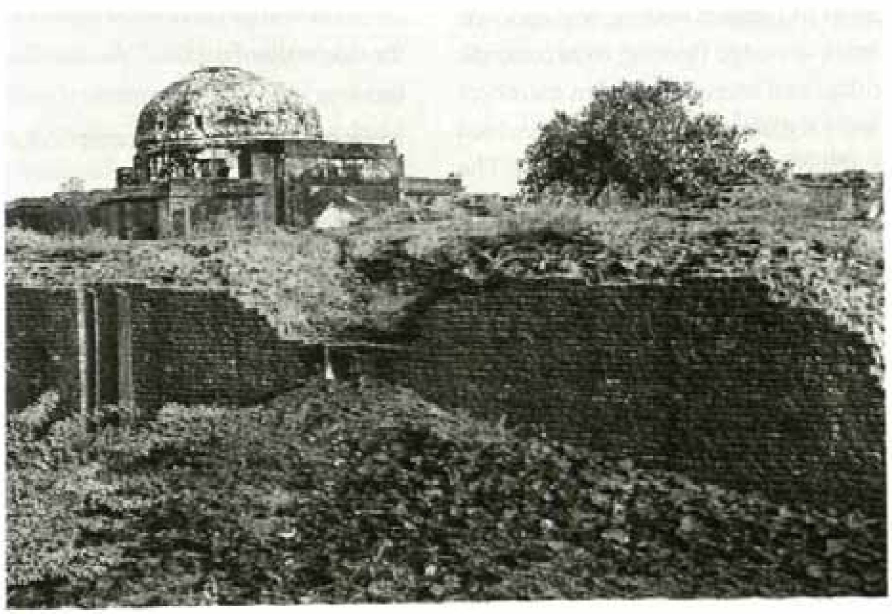
127. FEROZ SHAH'S PALACE, HISSAR, DISTRICT HISSAR

The damged and collapsed portions of the brick masonry parapet wall were repaired. The damaged retaining wall in stone random rubble masonry was also restored. The sunken and damaged flooring of the cells were also reset over concrete base.

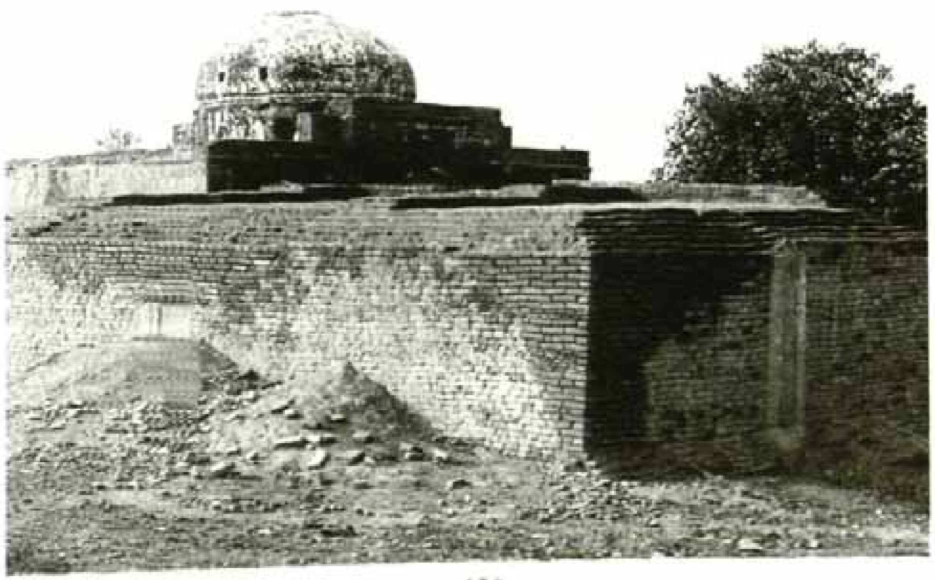
128. PRITHVIRAJ CHAUHAN'S FORT, HANSI, DISTRICT HISSAR

The dilapidated, out-of-plumb and damaged gateway to the two mosques inside the fort was taken up for repairs for the first time. The fallen patches of the brick masonry were repaired by underpinning and pointing. The fallen arches were restored and the roof top watertightened. The voids and cracks were stitched and filled up. The work is in progress (pls.l 19-120).

Plates 119-120



119



120

Prithviraj Chauhan's Fort, Hanṣi : 119, *before and* 120, *after conservation*

129. CANTONMENT CHURCH TOWER, KARNAL, DSTRICT KARNAL

The decayed and sunken flooring was removed by relaying brick-on-edge flooring over concrete base. The broken and missing wooden members of the doors were replaced and *jalis* were provided to stop entry of birds, etc. at different levels. The broken steps of wooden ladders were repaired. The handpump was also made functional. Steps were also taken to remove/clear the vegetational growths from the compound of the monument.

130. SHEIKH CHILLI'S TOMB, THANESAR, DISTRICT KURUKSHETRA

The leakage from the roof terrace of the cells on the eastern side of the *madarsa* was checked by removing the decayed and pulverized lime-cement-concrete and relaying a fresh concrete. The top was watertightened. The patches of the peeled off plaster of the inner cells were also raked out and replastered. The damaged wooden door shutters and frames were replaced with new ones. The fallen and damaged side cells of the eastern gate were also repaired and watertightened. The loose and disloged huge red sandstones of the *burji* at the corner were also removed and reset as per original.

131. JAL MAHAL, NARNAUL, DISTRICT MAHENDERGARH

The sunken, damaged and decayed lime-concrete flooring of the main entrance of the Mahal was taken up for repairs by removing the decayed concrete and re-concreted as per original.

132. KABULI BAGH MOSQUE, PANIPAT, DISTRICT PANIPAT

Patch repair to the brick masonry of the rear wall of the tomb was taken up and the work is in progress.

133. SHAHJAHAN-KI-BAOLI, MEHAM, DISTRICT ROHTAK

The work of restoration and reconstruction of the side walls of the Baoli damaged during floods in the area was further continued and the provision made in the estimate was carried out and completed.

PUNJAB

134. RAM BAGH GATE, AMRITSAR, DISTRICT AMRITSAR

The work of resetting ornamental red sandstone *chhajjas and jalis* at the top portion of the Baradari was taken up and is in progress.

135. BHATINDA FORT, BHATINDA, DISTRICT BHATINDA

In continuation of the previous year's work *(1997-98,* p. 291), the patch repairs to both inner and outer fortification wall (EIB-I) and adjacent wall upto stairs was taken up by removing and dismantling the loose and pulverized portion and repointing the joints of the brick masonry. The parapet wall wherever damaged was repaired and reconstructed. The top brick flooring of the ramp of the fortification wall (EOB-4) was also watertightened by laying tile bricks as per provision in the estimate. The outlets were made functional. The work is in progress.

136. TAKHAT-I-AKBARI, KALANAUR, DISTRICT GURDASPUR

The decayed concrete of the terrace was removed and reconcreted. The loose and sunken brick masonry was dismantled and restored as per original.

137. SHAMSHER KHAN'S TOMB, BATALA, DISTRICT GURDASPUR

The patch repairs to the outer face of the tomb were taken up. The loose, dislodged and bulged-out brick masonry was removed carefully and restored as per original. The plaster wherever decayed and damaged was removed and replastered. The intact original plaster was preserved by edging. The cracks and voids were filed up by grouting. The rain outlets were also repaired.The work is in progress.

138. MUGHAL BRIDGE, JAHANGIR, DISTRICT JALANDHAR

In continuation of the previous work *(1997-98,* p. 291,), the cracks developed on the side walls of the span of the Mughal Bridge were stitched and pulverized portions were dismantled and restored. The joints of the brick masonry were pointed and top watertightened. The sunken concrete was removed and reconcreted. The disturbed brick masonry was also taken out and repaired.

139. DAKHNI SARAI, DAKHNI, DISTRICT JALANDHAR

The damaged portions of the cells of the Sarai were taken up for repairs by restoring the missing portions and pointing the joints of the brick masonry of the arches, inner and outer walls and vault roofs as per adjacent portions, raking out the decayed lime concrete of the patches and relaying the sunken and dislodged flooring (pls. 121-122). The open area inside the quadrangle was also levelled for developing garden.

140. ANCIENT SITE, ROPAR, DISTRICT RUPNAGAR

In continuation of the previous year's (7997-*98,* p. 292) work, the missing and damaged portions of the brick masonry work were repaired and joints were pointed. The cracks wherever found were stitched and the top watertightened. The entire area was fenced with barbed-wire.

141. ARCHAEOLOGICAL MUSEUM, ROPAR, DISTRICT RUPNAGAR

The repairs to the Museum building was also attended to by watertightening the roof-top after removing the decayed and dead concrete and relaying brick tiles over fresh concrete base. The joints of the brick tiles were pointed.

CHENNAI CIRCLE

TAMIL NADU

142. BRITISH INFANTRY OFFICER'S MESS (NOW HOUSING THE FORT MUSEUM, BLOCK NO. XXXVI/ 2, FORT ST. GEORGE, DISTRICT CHENNAI

In continuation of the last year's work *(1997-98,* p. 292), the terrace over Galleries 8 and 9 was rendered watertight by using combination mortar with waterproofing compounds after removing the old and weathered courses. The decayed wooden joists in reserve collection room were carefully removed and replaced with new ones. Iron rolling shutters were repaired in Galleries 3 and 4.

143. CLIVE'S HOUSE, FORT ST. GEORGE, DISTRICT CHENNAI

The damaged old A/c pipe sewage lines were replaced with new PVC pipes. The fallen terrace to the south-west of the Epigraphy Office was relaid and watertightened.

Patch plastering and pointing was done in different chambers wherever necessary. The damaged wooden flooring was replaced with the new ones in the southeastern wing of the first floor. The damaged roof in the north-east corner of the ground floor was

Plates 121-122



121



122

Dakhni Sarai, Dakhni : 121, *before and* 122, *after conservation*

dismantled and then relaid in R.C.C. The doors and windows were repaired. Patch plastering of the walls were carried out.

The decayed plaster of southeastern wing of the ground floor was replastered with machine ground combination mortar with necessary underpinning in brick masonry.

144. MURUGANATHA TEMPLE, TLRUMURUGANPOONDI, DISTRICT COIMBATORE

The damaged out-of-plumb front pillared *mandapa* at the entrance was dismantled. Necessary foundation was laid for the pillar bases with cement concrete 1:4:8 and over that pillar stone bases were refixed to plumb, after proper setting and curing. Stone pillars were re-erected to plumb as per original. The terrace was watertightened with brick jelly concrete in pure lime in two layers, and then two courses of country flat tiles were laid and plastered with combination mortar 1:1:5 adding waterproofing compound. Flooring inside the *mandapa* was laid.

145. CHENNARAYAPERUMAL TEMPLE, ADIYAMANKOTTAI, DISTRICT DHARMAPURI

Laying of gravel on the pathway leading to the temple and painting of the 'L' angles of fencing posts with smoke grey enamel paint was done.

146. HILL FORT, ROYAKOTTAI, DISTRICT DHARAMAPURI

The heavy growth of rank vegetation from the protected area was removed. Pointing the wide joints of the rubble stone steps leading to the top with cement-mortar was completed. The fencing posts were painted with smoke grey enamel paint.

147. JAINA TEMPLE, METTUPUDUR, DISTRICT ERODE

The old wooden door of the temple was painted with two coats of synthetic enamel paint after scraping the old painted surface. The protected area was cleared of vegetational growth.

148. SUGRISVARA TEMPLE, SIRCAR PERIYAPALAYAM, DISTRICT ERODE

The temple compound was levelled after clearing the accumulated earth inside.

149. DHEUNUPURISVARA TEMPLE, MADAMBAKKAM, DISTRICT KANCHIPURAM

The dead weathering course over *maha-mandapa, mukha-mandapa* was removed and relaid with brick jelly concrete levelling course.

150. MUNKUDUMI EASVARA TEMPLE, P.V. KALATHUR, DISTRICT KANCHIPURAM

The damaged stone ceiling slabs over the *mandapa* and *prakara* of Amman Shrine were replaced with new ones and the roof was watertightened.

151. RUINED DUTCH FORT AND CEMETERY, SADRAS, DISTRICT KANCHIPURAM

The fallen fortification wall on western and south western sides was reconstructed using special brick as per original.

152. VAIKUNTHAPERUMALA TEMPLE, KANCHIPURAM, DISTRICT KANCHIPURAM

The moss and lichen grown over the Vimana of the main temple was removed and two coats of water proof paint was applied in view of Maha-samprokshanam.

153. SRI RANGANATHASVAMY TEMPLE, NAMAKKAL, DISTRICT NAMAKKAL

The joints of the stone steps leading to the top of the temple were pointed. The temple doors and

fencing posts were painted with smoke grey enamel paints after scraping old painted surface.

154. BRIHADISVARA TEMPLE, GANGAIKONDA CHOLAPURAM, DISTRICT PERAMBUR

A drain of R.R. masonry was constructed from *mahadvara* on the eastern side upto the river on the rear side of the temple to drain out rain-water from the temple-complex. The area in the south-west and north-west sides of the temple-complex was fenced.

In the past, the entrance space on south as well as north was reduced by erection of side walls as well as filling on the top, so as to safeguard the broken lintel. This action has marred the beauty and prevented light and air. This was rectified by the following action.

The lintel over the southern door and stone door jambs were mended and the temple-type door was provided in order to improve the natural light and ventilation inside the temple.

155. ROCK-CUT VISHNU TEMPLE, TIRUMAYAM, DISTRICT PUDUKKOTTAI

The modern structure (kitchen) made of brick and mud/lime-mortar was removed. The accretionary mud and brick walls in the pillared-wawdopa was completely removed and was provided with M.S. grills. The damaged leaking terrace of the *madapalli* was watertightened.

156. SLKHANATHASVAMY TEMPLE, KUDIMIYANMALAI, DISTRICT PUDUKKOTTAI

The Rajagopura was watertightened after removal of dead weathered plaster. The tiers were strengthened by underpinning and filleting the joints. The weathered plaster over the stucco figures was removed and replastered with fine lime-mortar to match the original.

157. SIVA TEMPLE, AMMANKURICHI, DISTRICT PUDUKKOTTAI

The sunken pillars in the *madapalli* were reset after providing proper stone jelly concrete and R.R. stone flooring. The stone beams and ceiling slabs were reset properly.

158. SIVA TEMPLE, ARIYUR, DISTRICT PUDUKKOTTAI

The damaged plaster of the pillared *mandapa* roof was removed and relaid with pressed tiles and watertightened. The Vimana of the Amman Shrine was consolidated and rendered watertight by replastering it. The joints of the *talas* were pointed. The damaged stucco figures were mended and strengthened properly. The missing *chhajjas* were restored as per original and put *in situ*. The*prakara* wall in front of the shrine, sub-shrine, *madapalli* were completely dismantled and reconstructed as per original after laying proper foundation.

159. SOUNDARAJAPERUMALA TEMPLE, IRUMBANADU, D ISTRICT PUDUKKOTTAI

The damaged undulated stone flooring in the northern cloistered *mandapa* was removed and relaid with new stones as per original.

160. UTTAMANATHASVAMI TEMPLE, KIRANUR, DISTRICT PUDUKKOTTAI

The Rajagopura, Vimana of the main shrine and the Amman Shrine were completely washed, strengthened and rough plastered in lime-mortar. The stucco figures were strengthened by handground lime mortar.

161. AIRAVATESVARA TEMPLE, DARASURAM, DISTRICT THANJAVUR

Earth work around the *mahadvara* to expose the original working level and buried structural remains was done.

The out-of-plumb and dislodged outer ornamental veneer stones of *mahadvara* (southern side) were carefully dismantled and reconstructed as per original upto five rows from *upana*. The accretionary stone/brick masonry wall in *maha-dvara* including the ceiling slabs, capitals and stone beams were dismantled.

Stone jelly concrete 1:3:6 for foundation was laid. R.R. masonry footing in combination mortar **1:1:4** was constructed with available old stones over which five courses of the wall were reset as per original.

162. BRIHADISVARA TEMPLE, THANJAVUR, DISTRICT THANJAVUR

The undulated damaged stone flooring on the southern *side prakara* was removed and relaid with available old and new stones after proper dressing. The joints were pointed. The damaged brick pathways were relaid.

163. FORT, VELLORE, DISTRICT VELLORE

The thick rank vegetational growth was removed. The damaged dead plaster was removed from the eastern side of the fortification wall and replastered after underpinning the exposed surface with special size bricks. A fresh weathering course with pure lime-mortar in brick jelly concrete at the main entrance of the upper rampart was laid.

164. MOSQUE, VELLORE FORT, DISTRICT VELLORE

The dead plaster from the walls and ceiling of the Masjid was carefully removed and replastered with combination mortar. The dead weathering course was removed and relaid with a fresh one using brick jelly concrete in pure lime with two layers of flat tiles and plastered with combination mortar.

165. PATALESVARA TEMPLE, BRAHMADESAM, DSTRICT VLLLUPURAM

In continuation of the last year's work *(1997-98,* p.297), the fallen and disintegrated outer stone veneer on the southern side was dismantled and reconstructed as per original after removing the vegetational roots from the core.

The brick Vimana was consolidated and strengthened. The terrace of *arddha-mandapa* was watertightened.

166. AZAGIYA NARASIMHA PERUMALA TEMPLE, ENNAYIRAM, DISTRICT VILLUPURAM

The weathered, disintegrated and damaged Vimana was carefully mended with original size bricks in pure lime-mortar, base plastering done as per original and over that a thin coat of fine hand ground lime paste with jaggery and galnut water was applied. The damaged stucco figure was carefully mended with special size bricks in pure lime-mortar and the finishing was done with fine handground lime paste. The cracks on the Vimana was grouted and the joints mended. The damaged leaky weathering course of the *arddha-mandapa* was removed and relaid with brick jelly concrete in pure lime over which a layer of pressed tiles was laid.

167. FORT, GINGEE, DISTRICT VILLUPURAM

In continuation of the last year's work *(1997-98,* p. 297), earth work excavation was done to expose the original flooring, plinth and drain on the northern side of the lower fort. The out-of-plumb cross-walls, arches were carefully removed and reconstructed as per original. The dead plaster of the arched ceiling was removed carefully and replastered.

168. SAADAT-ULLAH KHAN'S MOSQUE, FORT GINJEE, DISTRICT VILLUPURAM

The weathered dead plaster of the ornamental pillars, arches, walls and *chhajjas* were carefully removed and replastered as per original.

PONDICHERRY

169. SHRI MOOLANATHASVAMY TEMPLE, BAHOUR, PONDICHERRY

The moss and lichen infested over the *vimana* was removed. The stucco figures were strengthened first by mending with combination mortar and then applying fine lime-plaster over it and matching with the original. The damaged plaster of the *gopura* was removed and replastered after consolidating and watertightening.

The dilapidated *madapalli* was completely dismantled and reconstructed.

The reined *yagasala* was dismantled and re-erected as per original.

DHARWAD CIRCLE

KARNATAKA

170. VEMYAR GUDI, AIHOLE, DISTRICT BAGAJLKOT

The dilapidated sunken temple was documented, dismantled and reconstructed as per original after providing necessary foundation including missing stone members, mending the broken beams and slabs. The area was levelled after clearing the thick thorny jungle and a drainage and approach road also provided (pls. 123-124).

171. KAMALA NARAYANA TEMPLE, DEOGAON, DISTRICT BELGAUM

The dilapidated mud masonry retaining wall of the temple which was out-of-plumb line was dismantled and reconstructed with roughly-dressed stone masonry. Ornamental grill was provided above the retaining wall and a gate was also provided. New steps and plinth protection apron were provided around the temple. Electrification was done and security lighting was provided.

172. PANCHALINGESVARA TEMPLE, HOOLI, DISTRICT BELGAUM

To solve the problems of encroachment and misuse of the premises, boundaries were fixed and a compound wall on the northern and southern sides was raised. Ornamental grills were fixed on the eastern and western sides and a gate was also provided. The leakages in the masonry of the Vimanas were stopped by pressure grouting and the joints were pointed suitably. The walls were cleaned with mild detergent. A drainage was provided to drain off the surface water from the temple premises.

173. ASAR MAHAL, BIJAPUR, DISTRICT BAJAPUR

The walls were covered with a thick coat of lime. It was removed to expose the original plaster. The damaged portions of the plaster was removed and replastered with lime-mortar to match the original. The leaky roof of the main entrance gateway was dismantled and the decayed wooden ceiling was replaced with teak wood planks as per the original. *Surkhi* was laid above the planks and the top was finished with clay tiles set in cement-mortar. The external coping wall above the entrance was reconstructed as per original.

174. JUMMA MASJID, BIJAPUR, DISTRICT BIJAPUR

The acquisition of land pending for the past two decades for development of a garden around the

Plates 123-124



123



124

Veniyar Gudi, Aihole : 123, *before and* 124, *after conservation*

mosque was now taken up successfully with the State Authorities after evicting the encroachers. Immediately, after taking over the possession of land, the houses were demolished and a dwarf compound wall was constructed and a suitable grill was fixed above the dwarf wall to prevent further encroachment. A gate was also provided on the eastern side after levelling the area. The wall surfaces of the Masjid were covered with a thick coat of lime. To expose the original plaster the lime wash is being removed.

175. DODDABASAPPA TEMPLE, DAMBAL, DISTRICT GADAG

The gem of later Chalukyan architecture has lost its northern flank due to the collapse of the wall exposing the *mandapa*. The whole portion was reconstructed with matching stones and an apron was provided around the temple.

176. MIRJAN FORT, MIRJAN, DISTRICT UTTARA KANARA

The damaged northern bastion of the fort was reconstructed with the available stones and the missing ones were replaced by new ones. The rank vegetation grown inside the fort was removed and the fort was made accessible to the public by cutting the thorny bushes in the moat.

HYDERABAD CIRCLE

ANDHRA PRADESH

177. EASTERN GOPURA, SRI CHINTALA VENKATARAMASVAMY TEMPLE, TADIPATRI, DISTRICT ANANTAPUR

The remaining work of plastering and replacing damaged wooden rafters and beams of the *gopura* was completed. Also a portion of the missing brick *gopura* was rebuilt using ancient size bricks to a certain height as per existing pattern.

178. FORTIFICATION WALL, HILL FORT, GOOTY, DISTRICT ANANTAPUR

A part of the collapsed fort wall at the first entrance was reconstructed matching the existing wall.

179. RAMA'S BASTION, PENUKONDA, DISTRICT ANANTAPUR

Due to heavy rains the stone bastion over which a small brick tower was built, had collapsed pulling a part of the brick structure along with it. The stone bastion is now rebuilt and the brick structure is being repaired. The work is in progress.

180. SRI VIRABHADRASVAMY TEMPLE, LEPAKSHI, DISTRICT ANANTAPUR

The damaged and sunken portion of the cloister *mandapa* was removed and reset, This damaged roof concrete over the entire cloister *mandapa* on the northern side was removed and re-laid with fresh weatherproof concrete. The damaged surfaces of brick Vimana and other structures on the roof were repaired and replastered. The small portion of the missing wall on the northern entrance was rebuilt.

181. MOAT AND BUILDINGS, SIDDHOUT FORT , DISTRICT CUDDAPAH

After removing the debris from Naqqarkhana and the ancient ablution tank near the Mosque, reparirs were done by concreting and replastering wherever necessary. The damaged brick *gopura* of the Siva Temple was also repaired by underpinning and replastering. The removal of thick throny jungle over the fort walls, undulated and disturbed stone, earth work excavation in and around the Sivalayam and south *mandapa,* resetting of steps and pointing

the north side of south *mandapa* and spreading the gravel in-between the mosque and fort wall etc., were completed.

182. MOSQUE AND TEMPLES, GANDIKOTA FORT, GANDIKOTA, DISTRICT CUDDAPAH

The sunken portion of the arched-cells on the south-west corner of the mosque was opened and rebuilt as per the existing pattern. The work of plastering the arched-wall and ceiling of the great mosque with lime-mortar and reconstruction ofbulged support wall in front of the re-constructed arches of the mosque was completed. Removed the dead lime-plaster over the *mandapa* and replastered the same with 20 mm thick plaster.

183. SRI MUKESVARASVAMY TEMPLE, PEDDAMUDIUM, DISTRICT CUDDAPAH

The protected area around the ancient group of temples is being enclosed by constructing a low level masonry wall fixed with angle iron post and barbed-wire. The work is in progress.

184. SRI KUMARA RAMA BHIMESVARASWAMY TEMPLE, SAMALKOT, DISTRICT EAST GODAVARI

R.R. masonry buttress walls of *western prakara mandapa* were removed and then the sunken western gateway was dismantled after proper documentation. Old dead concrete over the roof of cloister *mandapa* (on eastern side) was removed and re-laid with brick jelly concrete. The old P.W.D. pointing to the inner *prakara* wall (on north side) was raked out and recess pointing was done. The reconstruction of the dismantled western gateway over a new foundation is in progress.

185. SRI BHIMESVARASVAMY TEMPLE, DRAKSHARAMA, DISTRICT EAST GODAVARI

The ongoing work of replastering the western *gopura* was completed and the high *prakara* wall, which was damaged due to cyclone, was repaired by underpinning, filling the core, providing missing coping and replastering wherever necessary. Provided pipe railing to the *mukha-mandapa* of first floor of the main temple, in view of security of the visiting pilgrims and tourists. Reconstructed the fallen breach of outer *prakara* wall, on south-east corner, with available old stone and the top surface was provided with coping.

186. BUDDHIST STUPA, BHATTIPROLU, DISTRICT GUNTUR

The damaged barbed-wire fencing around the protected area was removed and the area was enclosed by constructing a low level brick masonry compound wall fixed with angle iron posts and barded wire.

187. MAHASTUPA, AMARAVATI, DISTRICT GUNTUR

The work of enclosing the protected area on the eastern side ofMahastupa was completed by providing a dwarf stone masonry wall and fixing angle iron posts with barded-wire and diamond mesh frames.

188. SRI BHAVANARAYANASVAMY TEMPLE, BAPATLA, DISTRICT GUNTUR

The hidden *adhishthana* of the monument is being exposed by clearing the earth. To drain out the rain-water a stone apron is being provided round the temple and a pipeline is being laid to pump and drain out the water. Further the damaged roof is being repaired and glasses are being provided in the openings of the roof, for lighting. The work is in progress.

189. BALASHISSAR, GOLKONDA FORT, GOLKONDA, DISTRICT HYDERABAD

Construction of stone masonry wall and fixing of iron grill over it to enclose the protected area in front of Balahissar were completed. The environment is being developed accordingly.

For providing safe drinking water to the visitors at Golconda fort, water tanks were provided at different lev els over the hill and pipe line along with cables. The work was completed.

190. IBHWIIM MOSOCE, GOLKONDA FORT, GOt KONOA, DISTRICT HYDERABAD

This beautiful ancient Mosque on the hilltop is being repaired by underpinning the voids in the walls, watertightcning the leaky roof, flooring, replastering wherever necessay and mending stucco figures etc. The works is in progress.

191. DAD MAHAL IN RANI MAHAL-COMPLEX, GOI.KOINDA FORT, DISTRICT HYDERABAD

The damaged concrete over the roof of Dad Mahal and adjacent structures was removed and re-laid to stop ingress of rain-water. The adjacent walls were also strengthened by attending underpinning and pointing.

192. RAMMAHAL-COMPLEX, GOLKONDA FORT, DISTRICT HYDERABAD

Arched-structures in front of the ladies dressing hall was cleared of modern accretionary walls. The deteriorated floor in the ladies dressing hall was re-laid with cement-concrete in 1:4:8 with 40 mm metal and replastered with hydrated lime-mortar in 1:3 with 100° o cement. The dead lime-plaster from the surface of the walls of ladies dressing hall was removed and replastering was done as per the existing decorative pattern. The damaged stone parapet wall over the arches was rebuilt. The pointing of structures and watertightening the top of the walls were completed. The area in-between ladies dressing hall and arched-structure and the pathway were pitched paved w ith available stones.

The debris collected in the open courtyard in front of the Zenana Mosque was removed and the original floor was exposed. The damaged floor in the courtyard of the Mosque and the adjacent hall was re-laid with lime-concrete above a soling of stones. The damaged plaster of the walls was removed and replastered. The wall breaches were strengthened and the sides were pointed. The entire area was cleaned off all thick vegetation, modern accretions and the debris of the fallen walls.

The huge debris in the cells of Rani Mahal and Judgement Hall was removed to clean the area and also to allow the light to come in so as to stop bat's menace. The existing stone flooring in Rani Mahal including the open courtyard was pointed and the huge arched-walls and ceilings of the Mahal were replastered in the damaged portions. The work was completed in all respect.

The earlier pathway inside the fort were highly uneven and at few places they were eroded by the flow of rain-water. Roughly-dressed stone pitched pathway matching the ancient environment was provided from clapping portico to Ranimahal complex.

After removing the dead concrete over the roof of Banjara Darwaza. the same was re-laid with fresh weatherproof course by using concrete and plastered. The debris inside the structures was removed and floor was levelled and concreted. The wide joints of the ceiling were cleaned and pointed. Further a part of the missing portion over the entrance was rebuilt and the broken merlons over the platform were restored and mended as per the original. The construction of dwarf wall to fix diamond mesh frames is in progress.

The fallen debris of fort wall was cleared and stone members were collected for reuse wherever necessary. The breaches in the inner fort wall at the second level were rebuilt as per the existing pattern by using available heavy stone blocks. Restoration work of the damaged parapet walls over Rani Mahal is in progress.

The work of removal of thick growth of vegetation over the fort wall, ramparts etc., is in progress.

193. BANDAR FORT, MACHILIPATNAM, DISTRICT KRISHNA

The reconstruction of fallen brick walls, strengthening of existing walls and cells and providing concrete aprons to stop the ingress of water into the foundations etc., were completed. Fixing of ancient gate at the main entrance was also completed.

194. KONDAREDDY BI RZ, KI R>OOL, DISTRICT KURNOOL

A stone apron was provided all round the main structure and the damaged brick battlements on the top of the bastion were completely repaired and replastered. The damaged grill enclosing the open area at the bottom was removed and a low level stone wall was built and the grills were re-fixed. The small portion of the wall, which had collapsed, was rebuilt and also the damaged steps were removed and rebuilt.

195. UMA-MAHFSVARASWMY TF.virix, VACANTI, DISTRICT KURNOOL

The damaged roof of the *mandapa* around the Puskhanni was repaired by removing the dead concrete and relaying with fresh brick jelly concrete. The brick structures over the *mandapa* all round the Pushkanni were repaired by underpinning and rcplastcnng, besides mending the stucco figures.

196. ALAMPUR TEMPLE, DISTRICT MAHABOOBNAGAR

The work of laying pipe from the River Tungabhadra to Kudali Sangamcsvara Temple was completed and open well motor pump set was installed in the nvcr to fetch water. Developing lawn around the temple including plantation of flowers, and rose beds was completed.

197. NAVABRAHMA GROIP TEMPLE, ALAMPUR, DISTRICT MAHABOOBNAGAR

The area around the group of Visva, Vecra and Arka Brahma Temples was lowered to the earlier existing levels to expose the plinths. And the work of removing and resetting of disturbed and undulated flooring of the *pradakshinapatha.* platform around these temples, including providing new red sandstones wherever missing, was done as per original. The work of fencing by constructing a dwarf stone wall to fix with angle iron posts and diamond mesh frames and stone pitching around these temples is in progress.

198. ANCIENT MOUND (KNOWN AS BODIPATI DIBBA) RAMATIRTHAM, DISTRICT NELLORE

The protected area around the mounmenf was provided with barded-wire fencing using prc-cast RCC posts. The work is in progress

199. SRI RANGANAYAKULA TEMPLE-COMPLEX, UDAYAGIRI, DISTRICT NELLORE

The feancing of the area around the temple is in progress by constructing a stonewall and fixing barbed-wire. The work of watertightening of *alankara mandapa* adjacent to southern *gopura* and flooring of *mukha-mandapa* and *arddha-mandapa* is in progress.

200. RAMALINGESVARASVAMY TEMPLE-COMPLEX, SATYAVOLU, DISTRICT PRAKASAM

The damaged enclosure wall around the group of temples was removed and a new dwarf stone masonry wall was built and diamond mesh frames were fixed over it. A small shrine, which was totally disturbed, was removed and rebuilt. A stone apron of about one meter was provided around the main temple for stopping seepage of water into the foundation.

201. GROUP OF TEMPLES, MUKHALINGAM, DISTRICT SRIKAKULAM

The subsidiary shrines in Mukhalingesvara Temple were provided with new teak wood doors. The area around Bhimesvara Temple was fenced by constructing a dwarf wall and fixing angle iron posts and barded-wire over it. The leaky *sikhara* of Somesvarasvamy Temple was strengthened by grouting and pointing. Scattered, uneven stones of the *mukha-mandapa* of Sri Bhimesvara Temple were removed, re-laid and pointed. The coping of the *mainprakara* wall of Sri Mukhalingesvara Temple was replastered after removing the dead lime-plaster over it.

202. DURGABHAIRAVAKONDA, NEELAVATHI, DISTRICT VIJAYANAGARAM

The protected area around the monument is being enclosed with barbed-wire fencing using pre-cast RCC Posts. The work is in progress.

203. BOJJANNAKONDA, SANKARAM, DISTRICT VISHAKHAPATNAM

The huge rock-cut stupa on the hill top was restored by filling gaps and missing portions and its top was plasterd matching the original. The brick structures, brick veneering and platform around the rock-cut stupa were repaired and strengthened using bricks as per original and watertightened.

204. THOUSAND-PILLARED TEMPLE, HANUMAKONDA, DISTRICT WARANGAL

The sunken part of *pradakshinapatha* between north-east corner of Surya Shrine and *nandi,* was removed and its core was strengthened by underpinning. The work of resetting the architectural members back into their original position over a new foundation, including providing missing ornamental members, is in progress.

205. WESTERN MUD FORT GATEWAY, WARANGAL FORT, DISTRICT WARANGAL

The bulged-out stone veneering of the fort wall at the western entrance was removed and rebuilt to plumb and the top of the fort wall was concreted to stop ingress of rain-water into it. The entrance *mandapas* were strengthened by attending underpinning, pointing and concreting the top.

JAIPUR CIRCLE

RAJASTHAN

206. SAHELI BAZAR BUILDINGS, DAULAT BAGH, AJMER, DISTRICT AJMER

R.R. stone masonry with lime-cement mortar on the walls and replastering over it as on the ceiling of Saheli Bazar Building and Gateway of Taragarh Fort were done after dismantling the old and decayed plaster and bulged stone walls.

207. ANCIENT SITE, BHANGARH, DISTRICT ALWAR

Repairs to the old, decayed, fallen, exposed shop NO. 60, remains of southern side bazar with R.R. stone masonry and pointing in lime-cement mortar matching the original were done.

The ramp including parapet was repaired. Retaining wall of Mahal was restored in R.R. stone masonry and pointing in lime-cement mortar matching the original after clearance of fallen and damaged ramp was done.

Southern side fortification wall, Bastion No. IV to Ajmeri Gate was taken up for repairs in R.R. stone masonry including pointing in lime-cement mortar matching the original.

The northern side fortification wall Bastion Nos. Ill and IV were exposed and repaired with R.R. stone masonry including pointing in lime-cement mortar matching the original.

208. SIVA TEMPLE, NEELAKANTHA, DISTRICT ALWAR

Exposed lower portion of the temple Bagh-ki-Deori was repaired and painted after removing the loose, decayed and uneven stones.

209. DEEG PALACE, DEEG, DISTRICT BHARATPUR

Restoration of the compound wall of Hardeo Bhawan with R.R. stone masonry and plaster in lime-cement mortar after dismantling the bulged/damaged wall of the same was taken up besides stone flooring in the inner side of the Bhawan.

The compound walls of Katcha Bagh and nursery were restored with R.R. stone masonry in lime-cement mortar including fixing the M.S. grill partly on the top of the walls after dismantling the bulged/cracked portions.

210. ANCIENT FORT AND MONUMENTS, BAYANA, DISTRICT BHARATPUR

Restoration of lower fortification wall of the fort was completed with R.R. stone masonry in lime-cement mortar matching the original.

211. USHA MANDIR, BAYANA, DISTRICT BHARATPUR

The dead and decayed stone flooring in the courtyard of the temple was replaced after relaying lime-concrete on the bed and joints of flooring stones were filled with lime-cement mortar. The plaster work with LCM on walls of ground floor and first floor was taken up partly.

212. WALL PAINTINGS, HARDOTI PALACE, DISTRICT BUNDI

Watertightening treatment of the roof of Chitrashala was taken up.

213. CHITTAURGARH FORT, DISTRICT CHITTAURGARH

The base of Ghee-ki-Baori was partly exposed by clearing the *malba.*

The area near Samidheshvara Temple and Padmini Palace was improved by removing the debris.

214. SOMANATHA TEMPLE, DEO SOMNATH, DISTRICT DUNGARPUR

Removal and disposal of debris for cleaning the monument including sorting out the serviceable material was done.

215. BHATNER FORT, DISTRICT HANUMANGARH

Repairing of fortification wall and bastion Nos. 46 to 48 by underpinning with old *lakhauri* bricks in lime-cement mortar was carried out.

216. FORT INCLUDING ANCIENT TEMPLES, JAISALMER, DISTRICT JAISALMER

The collapsed portion of lower fortification wall in northern side was reconstructed partly with ashlar masonry of heavy stone in two line-dressing for facing and rubble stone wall inside in lime-cement mortar. Restoration of lower fortification wall was partly undertaken at northeastern and eastern side ring road by ashlar masonry of heavy stones for facing and big size rubble stone masonry wall inside with lime-cement mortar.

217. MANDORE FORT, DISTRICT JODHPUR

R.R. stone masonry in lime-cement mortar was done in the plinth portion at the entrance of Brahma Temple.

218. FORT, KUMBHALGARH, DISTRICT RAJSAMAND

R.R. stone masonry work in lime-cement mortar for preparation of pathway at *zanana* portion of Badal Mahal after digging and cutting the rocks and removal of hard soil mixed with stone pieces etc. was done.

219. RANTHAMBHOR FORT, DISTRICT SAWAI MADHOPUR

Restoration of fort wall from Supari Mahal to Delhi Gate was done partly as per original in R.R. stone masonry with lime-cement mortar.

220. HARSHANATHA TEMPLE, HARSH, DISTRICT SIKAR

Northern side boundary wall of Bhairon Temple was restored with R.R. stone masonry in lime-cement mortar and fixed the slab stones in the roof in lime-cement mortar.

KOLKATA CIRCLE

WEST BENGAL

221. GOKULCHAND TEMPLE, GOKULNAGAR, DISTRICT BANKURA

In continuation of the previous year's work *(1997-98,* p. 282), out-of-plumb boundary wall on the eastern side of the temple was brought to alignment by re-setting the stone blocks in combination mortar and the foundation of the wall was also strengthened (pls 125-126). The damaged *nata-mandapa* of the temple is being thoroughly conserved by re-setting the dislodged and out-of-plumb stone members in composite mortar. The work is being carried out on the eastern, western and frontal sides of the *nata-mandapa* taking into consideration the original structure, its alignment and components.

222. KALACHAND TEMPLE, BISHNUPUR, DISTRICT BANKURA

Filleting work was carried out at required places on the facades to retain the existing plan and ornamental plaster work on the facades.

223. NANDALAL TEMPLE, BISHNUPUR, DISTRICT BANKURA

Filleting work was carried out at required places of the temple to protect and preserve the existing original plaster on the facades.

224. RADHA-SHYAMA TEMPLE, BISHNUPUR, DISTRICT BANKURA

Filleting work to protect the existing original plan and ornamental plaster work on the facades of the temple was carried out taking into account the original texture of the plaster.

Plates 125-126



125



126

Gokulchand Temple, Gokulnagar : 125, *before and* 126, *after conservation*

225. RASMANCHA, BISHNUPUR, DISTRICT BANKURA

Filleting work to retain the existing old plaster at different portions of the structure was carried out matching the original plaster. Square net was fixed on the barbed-wire fencing to protect the garden from stray animals.

226. SHYAMA-SUNDARA TEMPLE, MADANPUR, DISTRICT BANKURA

The temple originally suffered from a weak foundation, consequently cracks developed on the plinth level and facades of the temple due to differential settlement. For strengthening the weak foundation of the temple, RCC beams were inserted at the corners and on all the four sides of the foundation of the temple. The cracks, developed on the plinth platform of the temple, were mended by brickwork. Brickwork was also carried out on other places of the plinth. Tale-tell glasses were fixed on the existing cracks or interior facades of the temple. Structural repairs were also carried out wherever required along with ornamental brickwork.

227. GOPALJI TEMPLE-COMPLEX, KALNA, DISTRICT BARDDHAMAN

The damaged brick-built boundary wall of the complex was repaired by underpinning brickwork. The restoration of the damaged decorative pillars were completed.

228. LALJI TEMPLE-COMPLEX, KALNA, DISTRICT BARDDHAMAN

Brickwork and re-plastering of the miniature *sikharas* of the main temple were completed matching the original. Brickwork and recess pointing to the damaged part of the pillars and walls of the *nata-mandapa* of the temple were completed. On the roof of an adjacent room lime-concrete was re-laid after changing its damaged beams and *burgahs.*

229. BRINDABAN CHANDRA THAKUR'S MATH, GUPTIPARA, DISTRICT HUGH

Brickwork by cutting new bricks to required sizes was done to the damaged portion of the Gaur-Netai Temple in lime-swr&/w-mortar along with recess pointing. After re-laying the double layer of tiles over the damaged portion of the roof 10 cm thick lime-concreting in proper gradients was carried out.

230. DARGAH OF ZAFAR KHAN GAZI, DISTRICT HUGLI

Underpinning of the walls of the Dargah was carried out at required places along with the water-tightening of the roof of the Dargah and removal of vegetation. Brickwork for the boundary wall was also completed.

231. DUPLEIX PALACE, CHANDAN NAGAR, DISTRICT HUGLI (UNDER CIVIL DEPOSIT WORK)

In continuation of the previous year's *(1997-98,* p. 285) work, conservation of auditorium building was done. Parapet wall with its damaged plaster was repaired. Damaged doors and windows of the auditorium building were repaired and renewed. Plastic emulsion paint was applied on the walls and flooring inside the auditorium building. Drainage system for water outlet of the Palace was fully repaired and revived by brickwork and plastering.

232. DUTCH CEMETERY, CHINSURA, DISTRICT HUGH

Clearance of vegetation from the cemetery was done. Brickwork in composite mortar was carried out on the damaged part of the boundary wall, tombs and obelisks inside the cemetery. Salt-affected damaged part of some of the tombs and obelisk was raked out and repaired by brickwork and plastering. Coping of the boundary wall was partly repaired.

233. KOCH BIHAR PALACE, KOCH BIHAR, DISTRICT KOCH BIHAR

In continuation of the previous year's work *(1997-98,* p. 285), the interior walls of the Durbar Hall and five adjacent halls in the ground and first floor on the northern side, their adjacent verandahs, landing and the frontal porch were all replastered and treated with lime punning and distempering to match the original adjacent portion. Damaged wooden doors were repaired with replacement of glass panes, and fresh polish was done on the doors and windows of the first floor. Painting on the exterior of the frontal facade was completed. Decorative cement base painting was also done on the walls of the southern side. The main dome above the Durbar Hall was painted with aluminium paint. Other small domes and turrets were also painted. Repairing of the doors of the main dome and replacing of damaged glass panes were also adopted along with fixing of small square net to the doors and windows of the dome of Durbar Hall. Marble floor of the Durbar Hall was thoroughly cleaned. Roof-ceiling of the Durbar Hall was restored. Basement of the metallic dome was thoroughly repaired and the roof of the Durbar Hall watertightened.

Barbed-wire fencing around the protected area was strengthened and its height was raised. Damaged pathway was renewed by consolidation of brick, lime and *surkhi.*

234. METCALFE HALL, KOLKATA

The roof terraces above the main exhibition hall, western, northern and southern verandahs and guest room were relaid in traditional lime-concrete-mortar over a layer of ferro-concrete with due replacement of burnt tiles in lime-*surkhi*-mortar as per original.The beams and *burgahs,* doors and windows of the verandahs were repainted. Replastering was also done on the walls and pillars on the eastern side, retaining all designs and mouldings by lime-and sand-mortar.

On the basis of an old photograph to provide an original get-up of the monument modern brick-built boundary wall around Metcalfe Hall was dismantled and replaced by fixing of M.S. grill on western and northern sides.

235. VICTORIA MEMORIAL HALL, KOLKATA (UNDER CIVIL DEPOSIT WORK)

Portion of boundary wall on southern side of the Victoria Memorial Hall was repaired by replacing damaged balustrades and renewing ancillary masonry work. The broken compound wall on the western side of the memorial building was also done. The bituminous pathway on the eastern side of garden of Victoria Memorial Hall was also carried out. Pointing of marble joints of the outer facades on the western side of the memorial building was also done as per original. Bituminous sheet from the top of the dome of Darbar Hall and waterproofing chemical was also applied for watertightening. Broken glass panes of the skylight were replaced. The skylights and lantern of the dome above the Darbar Hall were watertightened.

236. ADINA MOSQUE, ADINA, DISTRICT MALDAH

After the removal of old decayed concrete, lime concrete was relaid on the floor of the mosque below the Badsha-ki-Takht. Steel plates were fixed, tied with iron nuts and bolts at two cracked stone beams supported by brick pillars inside the mosque.

237. LOTTAN MOSQUE, GOUR, DISTRICT MALDAH

To remove the deep seated roots of trees, the saline affected bricks from the structures were taken out along with the dead mortar and the affected portions were mended by resetting the old bricks of same size. After removing the old and decayed lime-concrete from the dome, relaying of roof was done

with brick-khoa, lime and *surkhi.* Over the approach road 10 cm thick *murrum* was spread with brick-on-edging at both sides.

238. TANTIPARA MOSQUE, GOUR, DISTRICT MALDAH

After removing the deep rooted vegetation along with damaged bricks and dead mortar at different portions of the mosque, those portions were mended with old bricks in *vme-surkhi*-mortar.

239. PATHRA GROUP OF TEMPLES, PATHRA, DISTRICT MEDINIPUR

Foundation of Rasmancha and the three Siva Temples were strengthened by inserting RCC beams. Lime-concreting was done on the floors of the three Siva Temples and the Rasmancha. Ornamental stucco work was restored on the Rasmancha as well as restoration of ornamental brickwork on the three Siva Temples were also attended to. Conservation of the roof of the Rasmancha was attended to as per the original texture of the monument. After repairing the damaged wall of the Rasmancha both the sides of the wall was plastered with lime-sand-mortar.

240. HAZARDUARI PALACE, MURSHIDABAD, DISTRICT MURSHIDABAD

For fencing between Hazarduari Palace and Imambara on the river side, new boundary wall was erected after necessary earthwork and brickwork and over it angle iron posts were fixed to retain the barbed-wire fencing. Lime-concrete was relaid on the floor of some rooms in the ground floor and finished by lime-*surkhi*-mortar. 25 cm thick replastering was done in composite mortar of sand-lime and cement at required places on the interior walls. Two coats of distempering were applied on the walls. Lime pinning was done on the walls after replastering.

241. IMAMBARA, MURSHIDABAD, DISTRICT MURSHIDABAD

On the courtyard of southern side, sunken and damaged stone slabs were removed and reset in proper gradient after laying concrete cushion below them in order to prevent stagnation of rain-water. 10 cm thick lime-concrete was relaid over the roof on southern and eastern sides. Its top was finished with lime-*surkhi*-mortar (pls. 127-128). Replastering in composite mortar was done on the parapet wall of the roof on eastern side.

242. TOMB AND MOSQUE OF MURSHID QULI KHAN (KATRA MOSQUE), SABJI KATRA, DISTRICT MURSHIDABAD

On the damaged part of the walls on northern and southern sides, brickwork with special size bricks were done in lime-*surkhi*-rnortar matching the existing original facade. On the northern and southern sides of the mosque brick-on-edge border was done on one side of the pathway covered with tiles. Pointing was done on the walls of the mosque on southern and northern sides after raking out the dead mortar. 5 cm thick lime-*surkhi*-concrete mixed with little quantity of cement was relaid after removing old damaged concrete from the floor of the mosque. Vegetational growth was eradicated from the monument and its adjoining protected premises.

LUCKNOW CIRCLE

UTTAR PRADESH

243. VISHNU TEMPLE, GARHWA FORT, DISTRICT ALLAHABAD

Resetting and restoration of stone walls of the *mandapa,* ornamented stone column and uneven and

Plates 127-128



127



128

Imambara, Murshidabad : 127, *before and* 128, *after conservation*

buldged-out stone walls of the main temple were completed as per original. The work of grouting and filling up of wide and deep holes, cracks, was completed by providing liquid cement-mortar.

244. JAMA MASJID, DISTRICT BANDA

The boundary wall was constructed around the mosque as per the area marked in the site plan.

245. NILAKANTHA TEMPLE, KALINJAR FORT, DISTRICT BANDA

The broken, damaged stone *chhajjas* were replaced by new and old ones as per the original. The platform near the temple was cleaned off by removing the debris. The spongy and peeled off plaster of the roof was removed and fresh lime-plaster was provided to prevent further decay. The partial restoration of the fallen/missing C.R. Stone masonry of the fortification wall near Kali Mandir, battlements towards the west, wall above the Bhairo sculpture, was completed.

246. RAJA AMAN SINGH'S PALACE, KALINJAR FORT, DISTRICT BANDA

The decayed and dead, damaged thick lime-concrete (50 cm thick) of the roof of the palace was carefully removed and fresh lime-concrete was laid. Refuting of damaged wooden beams, ornamental *sal-wood* brackets, wooden rafters was done and then painted, matching the original. Wooden preservative was applied to the new wooden members.

247. BENT KHANAM'S TOMB, DISTRICT FAIZABAD

The spongy and peeled off thick layers of plaster of the dome, miniature domes were removed and replastered with thick lime-mortar after giving final shape and finishing including reproduction of water leaf patterned petals on drum of domes. The entire dome was restored including inverted lotus leaf on the apex of the dome.

248. MEMORIAL CEMETERY, DISTRICT JHANSI

Flag-stone pathway was provided between memorial pillar and the entrance.

249. PANCH MAHAL, JHANSI FORT, DISTRICT JHANSI

By providing dressed sandstone pillars, an asbestos sheet was laid on the rooftop of Panch Mahal. The fallen debris was cleared from the ground floor and provided narrow drains under the ground level for ensuring proper drainage of the rain-water.

The debris lying in the cells attached to the fortification was removed and replastered as per the original.

250. DHRUV TILA, BITHUR, KANPUR CITY, DISTRICT KANPUR

Barbed-wire fencing with angle iron frame was provided to prevent encroachment of the site.

251. KATCHERI CEMETERY, DISTRICT KANPUR

Pathway was provided inside the cemetery area to facilitate movement of visitors around the graves. The graves and memorial pillars were also repaired and replastered.

252. DASAVATARA TEMPLE, DEOGARH, DISTRICT LALITPUR

A pathway, along with the boundary wall, was constructed with the help of flag-stone.

253. JAINA TEMPLE, CHANDPUR, DISTRICT LALITPUR

A boundary wall of rubble stone masonry was constructed in combination mortar. Flag-stone apron was provided around the temple.

254. LAXMI-NARAYANA TEMPLE, CHANDPUR, DISTRICT LALITPUR

Construction of boundary wall with the help of locally available slatestones was completed in combination mortar. Flush pointing was done on the wall.

255. NILAKANTHA TEMPLE, PALI, DISTRICT LALITPUR

Retaining wall was provided along with weep holes for percolation of rain-water.

The roof of the main temple was reconcreted and replastered. The cracked flooring was pointed wherever necessary. The *chhajjas* of the main temple were also replaced with new ones.

256. SAHASRALINGA TEMPLE, CHANDPUR, DISTRICT LALITPUR

The damaged compound wall was repaired and pointed wherever required. Resetting of steps of the temple was completed.

257. AMJAD ALI SHAH'S MAUSOLEUM, LUCKNOW, DISTRICT LUCKNOW

Repairing of the facade of the tomb with moulded *lakhauri* bricks, stucco work in floral design was done as per original. The main hall was repaired with lime-concrete after taking out the old crushed and damaged concrete. The graves were reproduced with *lakhauri* brickwork and moulded plaster.

258. ASAF-UD-DAULA'S IMAMBARA, LUCKNOW, DISTRICT LUCKNOW

Towards the eastern and southern sides of the rear court of Bara Imambara, construction of brick boundary wall with ornamental iron railing was completed. The wall was plastered with lime, cement and *surkhi*. On the rear roof terrace of the Shah-n-Sheen of the Imambara, decayed and dead concrete was replaced with new one in accordance with the original.

The inner side of the parapet wall was restored in consonance with the original pattern.

259. BANQUET HALL, RESIDENCY, LUCKNOW, DISTRICT LUCKNOW

Extensive structural repairs which involve pointing, underpinning, watertightining with composite mortar were carried out in accordance with the original pattern. Wide cracks developed on the walls were stiched. A coat of plaster was applied to stop seepage.

260. BEGUM KOTHI, RESIDENCY, LUCKNOW, DISTRICT LUCKNOW

The building was repaired by underpinning, pointing and plastering.

261. BIBIAPIR HOUSE, LUCKNOW, DISTRICT LUCKNOW

The eastern side hall including the facade was pointed, edged and cracks filled to prevent further decay.

262. DILKUSHA PALACE, LUCKNOW, DISTRICT LUCKNOW

The ornamented compound wall of the southern side ofDilkusha Palace was reconstructed maintaining the original style.

263. NADAN MAHAL TOMB, LUCKNOW, DISTRICT LUCKNOW

Missing red sandstone slabs of the *chhajjas* of Solah-khamba and Nadan Mahal Tomb were replaced with new ones wherever necessary, after dressing them properly. The new stone slabs were fixed in accordance with the existing pattern.

264. RESIDENCY-COMPLEX, LUCKNOW, DISTRICT LUCKNOW

Construction of spectator's gallery was completed.

265. SHAHNAJAF TOMB, LUCKNOW, DISTRICT LUCKNOW

Restoration of the fallen canopy (eastern side) and the arches was completed as per original. The area from the foundation upto the plinth was filled with earth.

266. AKONA TEMPLE, DISTRICT MAHOBA

Out-of-plumb wall of the temple was reset after dismantling and an apron was provided around it.

267. MOHARI TEMPLE, DISTRICT MAHOBA

After dismantling, the temple was reset with the help of combination material as per original. A boundary wall with C.R. stone masonry was constructed around the temple.

268. SIJARI TEMPLE, DISTRICT MAHOBA

Resetting of ruined stone *ghats* (staircases) with combination mortar was completed.

The peeled off plaster of the roof was replaced with fresh ones, as per original.

A boundary wall of about 1.20m high was constructed around the temple with C.R. stone masonry.

The floor of the *mandapa andgarbhagriha* was replastered with lime-cement-mortar, maintaining the original pattern.

An apron with flag-stone was provided around the temple.

269. URVARA TEMPLE, DISTRICT MAHOBA

The floor of the temple was reset in accordance with the original pattern.

The *stone-ghats* connected with the lake were reset as per original. Pointing was done wherever required.

MINI CIRCLE

270. ARCHAEOLOGICAL MUSEUM, OLD GOA, DISTRICT NORTH GOA

The roof of the museum building was completely dismantled and repaired by replacing decayed wooden beams and rafters. The ceiling was provided with plain asbestos sheet and supported with teak wood beeding. The entire first floor was provided with electrical fittings. The gutters and down take pipes were provided to the *chhajjas* to drain off rain-water.

271. BASILICA OF BOM JESUS, OLD GOA, DISTRICT NORTH GOA

The damaged cement-concrete pathways was relayed at the entrance including the approach pathway to toilet block. The roof is provided with

new galvanized iron sheets below the Mangalore tiles of quadrangle cloister portion. The damaged asbestos sheets of roof of main altar were replaced. The decayed window shutters of the Basilica were replaced with new ones and the mini door of the church was repaired by replacing decayed bottom portion with new teak wood and supported with M.S flat. The decayed planks of quadrangle were replaced with fresh wood. Patch plastering of Art Gallery and quadrangle walls were completed.

272. CHURCH OF OUR LADY OF ROSARY, OLD GOA, DISTRICT NORTH GOA

The exterior walls were painted with cement paint (Snowcem) and interior with lime-wash. The window and door shutters were painted with synthetic enamel paint. The missing laterite stones of inside flooring of the church replaced with seasoned stones. The laterite stone apron was provided all around the church. The dislocated pulpit on southern side of the main church was repaired and reset to its original place.

273. CHURCH OF ST. CAJETAN, OLD GOA, DISTRICT NORTH GOA

The decayed plaster, lichen and moss developed on the walls of choir portion was replastered with lime-cement-mortar mixed with waterproofing compound and neeru finishing over it. The open terrace of the roof and dome portion was provided with cement-concrete and plastered by mixing waterproofing compound. The damaged and sagged laterite stone platform at the entrance was removed and relayed with seasoned laterite stones. The walls of the first floor rooms were replastered with lime-cement-mortar.

274. CHURCH OF ST. FRANCIS OF ASSISI, OLD GOA, DISTRICT NORTH GOA

The decayed window shutters on southern side of the church was replaced with new ones and provided with welded mesh. The decayed wood at the bottom portion of the main door was repaired by replacing with new ones and supported with M.S. flat. The decayed plaster of the choir wall was replastered with fresh lime-cement-mortar mixed with waterproofing compound and neeru finishing over it. After deplastering the wall, some cracks were noticed. These cracks were stitched off with copper dowels and epoxy resin. The leaky tiled roof of aisles with wooden frames were dismantled and the unwanted load of earth on the roof was removed and restored with cement-concrete and plastered by mixing waterproofing compound.

275. LOWER FORT, AGUADA, CANDOLIM, DISTRICT NORTH GOA

The rank vegetation grown over the wall and tree roots that had damaged the fort wall were removed. In order to strengthen the wall, the wall connecting the circular bastion and part of the bastion were pointed.

276. SE' CATHEDRAL, OLD GOA, DISTRICT NORTH GOA

The cracks developed in the basal mouldings of the pillar inside the church were replastered in combination with lime-mortar. The decayed window shutters of the northern side were replaced with new ones.

277. UPPER FORT, AGUADA, CANDOLIM, DISTRICT NORTH GOA

The roof of the water tank developed cracks at several places allowing seepage of water. Hence the

decayed plaster was removed and relayed with fresh ones, after filling the cracks. The fortification wall towards north and the moat wall towards east were pointed with combination mortar and cavities in the bed-rock upon which the walls were raised filled with cement-concrete.

MINI CIRCLE, SHIMLA

HIMACHAL PRADESH

278. GROUP OF TEMPLES, BHARMOUR, DISTRICT CHAMBA

The decayed and missing slates of the roof of the Lakhna Devi and Ganesa Temples were replaced. The decayed wooden members including planks and rafters wherever necessary were also replaced. The repairs to the flooring of the Mani Mahesh Temple is being taken up.

279. HARI RAI TEMPLE, CHAMBA, DISTRICT CHAMBA

The canopy of the *sikhara,* roof of the *mandapa* and porch of the temple were taken up for repairs by replacing the decayed and damaged wooden members including wooden rafters and planks and slatestone as per original.

280. LAXMI-NARAYANA GROUP OF TEMPLES, CHAMBA, DISTRICT CHAMBA

The damaged and decayed wooden members of the *chhatri,* canopy and porch of the main temple including planks and rafters were dismantled and replaced with new ones as per original. The top slate stones were refixed as per original. The damaged and broken slates were replaced with the new ones as per original.

281. NARBADESVARA TEMPLE, SUJANPUR, DISTRICT HAMIRPUR

The work of relaying flag-stone flooring inside the courtyard of the temple after dismantling the sunken and disjoined stone was taken up. The loose wiring inside the shrine was also replaced with new ones. Incomplete retaining wall in front of the temple was raised upto the ground level in hard stone. The decayed and damaged wooden frames and shutters of the windows were replaced. The decayed and pulverized plaster of the outer walls of the temple were removed and replastered. The decayed and weathered stones of the miniature Nandi Shrine were also replaced with new ones.

282. KANGRA FORT, KANGRA, DISTRICT KANGRA

The crumbled structures at the top of the fort were taken up for repairs. The cracks were stitched. The broken and fallen portions of kitchen were restored and top watertightened. The sunken and dislodged flag-stone flooring was dismantled and reset as per original. The drains were made functional. The overhanging arched-wall was given proper support to stop further damage and collapse. The steps at the top were also repaired.

Drinking water facilities to the visitors at the top of the fort was also provided by lifting water from *goumukha* with the financial assistance form the H.P. Tourism Department. The fort was also illuminated with lights provided by the H.P. Tourism Department.

283. KOTLA FORT, KOTLA, DISTRICT KANGRA

Uprooting the vegetational growth from the structures, levelling and dressing of undulated area, removal of loose and decayed stone masonry of the walls and their restoration etc. were taken up and the work is in progress.

284. NURPUR FORT, NURPUR, DISTRICT KANGRA

The fallen building materials of the roof as well as accumulated debris were removed from the rooms of Rani Mahal and original lime-concrete flooring exposed. The vegetational growth from the top structure as per the provision was also removed and uprooted. The undulated area in front of Rani Mahal was levelled and dressed.

285. ROCK-CUT TEMPLE, MASRUR, DISTRICT KANGRA

The work of grouting and filling up of cracks and gaps at the top was taken up and completed to check seepage of water. The supports to stone masonry were provided to the wide cracks of the side rocks. The sunken flooring was removed and reset as per original.

286. GAURI SHANKARA TEMPLE, DASSAL, DISTRICT KULLU

Extension of boundary wall on south, south-east and north-west corners was taken up during the period and under review.

287. GAURI SHANKARA TEMPLE, NAGGAR, DISTRICT KULLU

The fallen and bulged-out portion of the retaining wall on the back side of the Lakshmi-Narayana Temple was removed, dismantled and reconstructed as per original. The pointing of joints of the *sikhara* of the temple was also attended to. In order to check erosion of soil, buttress wall was also provided on road side.

288. BUDDHIST MONASTERIES, TABO, DISTRICT LAHAUL AND SPITI

The bulged-out portions of the outer walls of the Du-Khang and Bromton Lha Khang were provided with supports at intervals. The damaged portions of the outer boundary wall were also repaired. The pulverized and peeled off plaster of the shrine wherever necessary was raked out and replastered. The decayed mud-plaster of the *chortens* was removed and replastered. The *parnalas* were repaired and made functional. The decayed and peeled off wall plaster at the base inside the Byambai Lha Khang was removed and replastered. The out-of-plumb portions of the entrance wall were also provided with wooden props from collapse. The front courtyard was reconcreted.

289. MIRKULA DEVI TEMPLE, UDAIPUR, DISTRICT LAHAUL AND SPITI

The platform and retaining wall of the temple on the eastern side was further extended. The dislodged stone steps were repaired by dismantling and resetting the stones. The door and windows of the porch were provided with M.S. grill to avoid theft of antiquities. The beams of the sanctum and the damaged and decayed wooden pillars were given additional support. The roof was also provided with wooden props. Loose electric wiring was replaced for safety measures.

290. PHOO GUMPHA, TABO, DISTRICT, LAHAUL AND SPITI

In order to check landslide from the hill on the back side of the shrine, the modern retaining wall was further extended. Seepage of water inside the Du-Khang was also checked by providing proper drains.

291. PANCHAVAKTRA TEMPLE, MANDI, DISTRICT MANDI

The work of providing flag-stone flooring on the back side of Bhairava Batuka and left side of the

Panchavaktra Temple were completed. The platform of the temple was also extended and completed. The work of pointing the open joints of the stones of the *sikhara* of the temple, due to chemical treatment, was also completed in all respect. The voids and gaps were filled up. With this the leakage of water from rooftop was checked.

PATNA CIRCLE

BIHAR

292. EXCAVATED REMAINS, VIKRAMSHILA MONASTERY, ANTICHAK, DISTRICT BHAGALPUR

In continuation of the previous year's *(1997-98,* p. 314) work, decayed and missing portions of Hindu temple-complex, Jaina temple-complex and postern gate were consolidated and restored by underpinning, dismantling and resetting, pointing in recess and watertightening of top courses. An apron in lime-concrete was provided as per original to check seepage of rain-water. Approach pathway was laid in lime-concrete with its edges bounded with bricks. The dumped earth between the structures and the gate was removed and the area was dressed for clear visibility of monastery-complex.

293. SIVA TEMPLE, KONCH, DISTRICT GAYA

The damaged and bulged portions were brought to plumb by dismantling and resetting as per original. Collapsed portion of the *sikhara* was restored. Dead plaster was removed and replastered as per original.

294. EXCAVATED REMAINS, NALANDA, DISTRICT NALANDA

To the north of the tank, recently excavated ,votive stupas were consolidated by resetting ofbricks, pointing on faces and watertightening of top three courses. Consolidation of structures by pointing in recess, watertightening of top courses and resetting of decayed portions were carried out in Temples 3 and 12 and Monasteries 1,4 and 5. Construction of boundary wall consisting of dwarf wall with grill fencing over it was done towards the eastern side of the site.

295. GRAHAM'S HOUSE, BANKIPUR, PATNA, DISTRICT PATNA

The floor of the halls was paved with marble tiles. An apron and drain all around the building was provided to prevent percolation of water into the foundation. Entire dead plaster of the walls was removed and replastered. Rotten doors and windows were replaced in accordance with the original. Walls, beams, door and windows were painted with suitable colours.

296. HASAN SHAH SURI'S TOMB, SASARAM, DISTRICT ROHTAS

The Burzees and Chhatris were consolidated by way of removing the dead plaster and replastering and resetting of damaged portions. Approach pathways were paved with stone tiles as per original.

297. SHER SHAH SURI'S TOMB, SASARAM, DISTRICT ROHTAS

In continuation of the previous year's *(1997-98,* p. 315) work, the consolidation of Burzees and *chhatris* were completed. Stone tiles were paved along the parapet of the main tomb. Corner domes were replastered after removing the dead chunks of plaster. Entrance gate and its flight of steps were strengthened by way of plastering, pointing and replacing the decayed stones. The floor of the

Qanati Mosque in front of the entrance was paved with stone slabs and the adjacent area was developed for parking.

298. ANCESTRAL HOUSE OF DR. RAJENDRA PRASAD, JIRADEI, DISTRICT SIWAN

In continuation of the last year's work *(1997-98,* p. 315), the restoration of *baithak* portions was done by way of recasting of roof, changing rotten beam and batterns, repairing and replacing rotten doors and windows in accordance with the original. Building and the boundary wall were painted in suitable colour. Front lawn was developed beautifully by laying flower beds and pathways.

UTTAR PRADESH

299. TOMB OF DAULAT IBRAHIM, MEHNAGAR, DISTRICT AJAMGARH

Decayed chunks of plaster from the walls and the roof were removed and replastered with lime-*surkhi-mort&r* as per original. Vegetational growth over the building was uprooted.

300. OLD FORT, JAUNPUR, DISTRICT JAUNPUR

In continuation of the last year's work *(1997-98,* p. 315), the restoration of western boundary wall was completed using ashlar stones on the face besides bricks and rubbles in the core in accordance with the original.

301. NIRVANA TEMPLE, KUSHINAGARA, DISTRICT KUSHINAGAR

The platform of the Nirvana Temple was consolidated by watertightening the top courses and pointing and underpinning of the sides with *lime-surkhi* mortar. An apron around the structure was laid in order to check the percolation of rain-water into the foundation.

302. RAMABHAR STUPA, KUSHINAGARA, DISTRICT KUSHINAGAR

Structure near the Ramabhar Stupa was consolidated by way of pointing and watertightening. An apron around the main stupa was provided to prevent the percolation of water into the foundation of the stupa.

303. CHOUKHANDI STUPA, SARNATH, DISTRICT VARANASI

Restoration of lower terrace on the north-east corner of the stupa was done in continuation of the last year's work *(1997-98,* p. 316), using special size bricks and *Mme-surkhi* mortar as per original.

304. EXCAVATED REMAINS, SARNATH, DISTRICT VARANASI

Votive stupas and other structures towards the north of the main shrine were consolidated by recess pointing and watertightening of top courses using lime-*surkhi* mortar.

SRINAGAR CIRCLE

JAMMU AND KASHMIR

305. MUGHAL ARCADE, VERINAG, DISTRICT ANANTANAG

The lime-cement-concrete was laid to watertighten the roof after dismantling the old and dead concrete. Stone *chhajja* and brackets were

fixed in accordance with the original pattern. Besides M.S. railing was fixed around the spring.

306. SIVA TEMPLE, FATEHGARH, DISTRICT BARAMULLA

Chain link fencing over masonry wall was provided in order to enclose the protected area of the monument.

307. FORT, AKHNUR, DISTRICT JAMMU

Old and buried structures were exposed on the western side of Sheeshmahal by way of scientific clearance. Structural repairs to the fortification wall by way of brick masonry and pointing in combination mortar were also carried out.

308. ALCHI MONASTERY, ALCHI, DISTRICT LEH

Cement-concrete apron was provided around the Guru Chorten in order to stop the seepage of water in the foundation.

309. ANCIENT PALACE, LEH, DISTRICT LEH

Structural repairs by way of random rubble stone masonry and pointing were carried out to the southwestern side in consonance with the original pattern (pls. 129-130).

310. HEMIS MONASTERY, HEMIS, DISTRICT LEH

Old and decayed wooden members of the roofs such as poplar poles and twigs were replaced by new ones and the damaged walls of mud brick masonry were repaired following the original pattern (pls. 131-132).

311. MONASTERY, LAMAYURU, DISTRICT LEH

Buttress wall was provided in order to safeguard the overhanging structure from being damaged.

312. PHYANG MONASTERY, PHYANG, DISTRICT LEH

Structural repairs by way of laying mud-concrete and plastering were carried out in order to watertighten the roof strictly in conformity with the original pattern.

313. SHEY PALACE, SHEY, DISTRICT LEH

Old and decayed wooden members of the roof such as poplar poles and twigs were replaced by new ones, at different levels, following the original pattern (pls. 133-134).

314. THIKSEY MONASTERY, THIKSEY, DISTRICT LEH

Old and decayed wooden members of the roofs such as poplar poles and twigs were replaced by new ones following the original pattern.

315. AVANTISVARA TEMPLE, AVANTIPUR, DISTRICT PULWAMA

Chain link fencing over dwarf wall was provided in order to enclose the protected area of the monument.

316. SIVA TEMPLE, LADHUV, DISTRICT PULWAMA

Chain link fencing over dwarf wall was provided around the monument.

317. PARIMAHAL, SRINAGAR, DISTRICT SRINAGAR

Underpining of random rubble masonry, pointing and plastering in combination mortar were carried out.

318. TOMB OF ZAIN-UL-ABIDIN'S MOTHER, SRINAGAR, DISTRICT SRINAGAR

Joints of the brick masonry were pointed in combination mortar after stitching and grouting deep cracks on the southwestern side of the monument.

319. FORT, RAMNAGAR, DISTRICT UDHAMPUR

Structural repairs by way of course rubble masonry, pointing with combination mortar, replacing

Plates 129-130



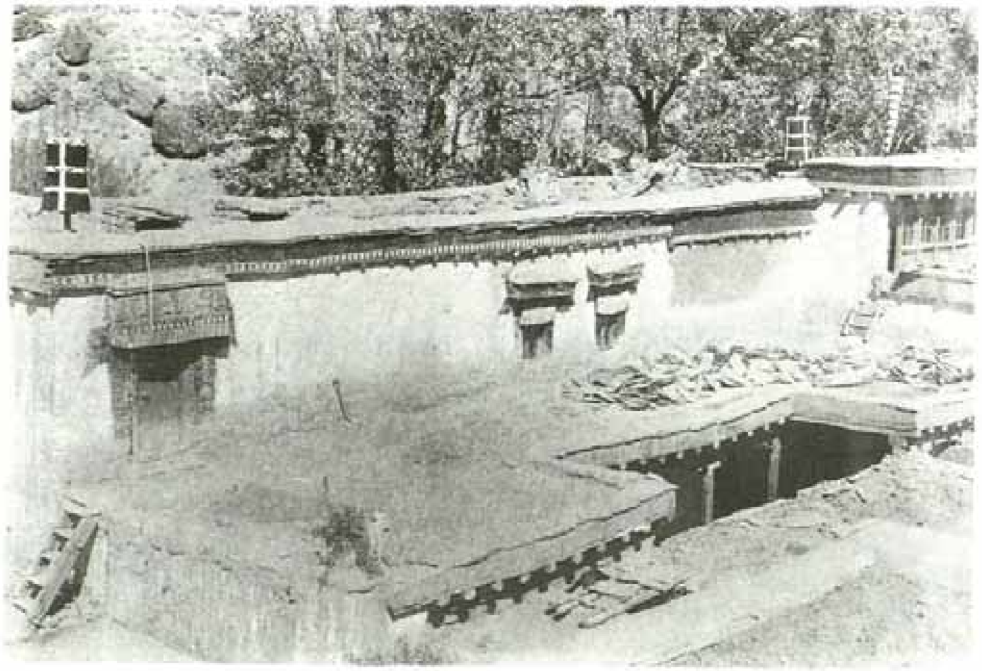
129



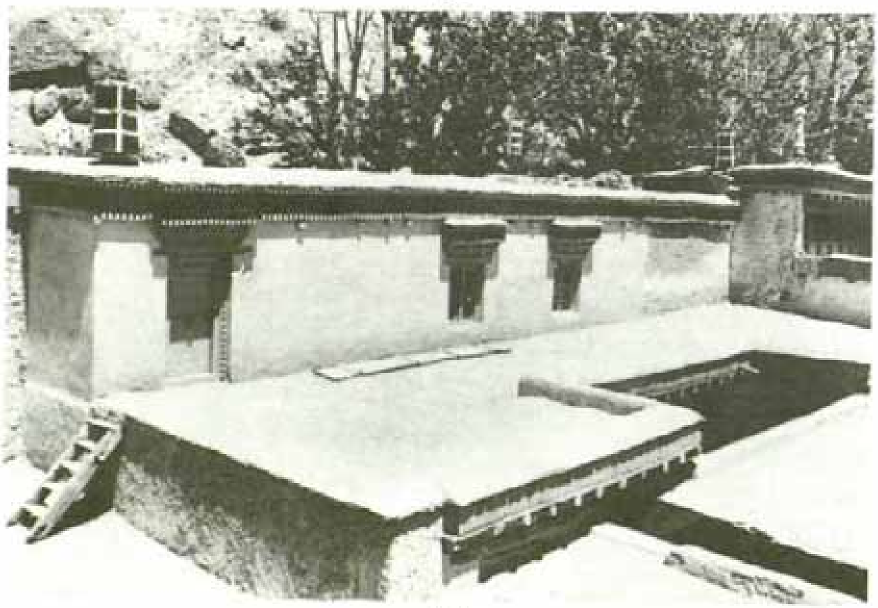
130

Ladakh, Leh Palace: 129, *before and* 130, *after conservation*

Plates 131-132



131



132

Ladakh, Hemis Monastery : 131, *before and* 132, *after conservation*

Plates 133-134



133



134

Ladakh, Shey Palace : 133, before and 134, after conservation

Plates 135-136



135



136

Udhampur, Ramnagar Fort : 135, before and 136, after conservation

of old and rottern beams and laying of lime-cement concrete were carried out on the southern side of the fort (pls. 135-136).

320. GROUP OF TEMPLES, KIRAMCHI, DISTRICT UDHAMPUR

Chain link fencing over dwarf wall was provided in order to enclose the protected area of the monument.

321. NAWA MAHAL, RAMNAGAR, DISTRICT UDHAMPUR

Old and decayed wooden beams, scantlings and planks were replaced with new ones as per original pattern. Beside it, lime-cement concrete on the terrace, rubble stone masonry and pointing in combination mortar were also carried out (pls. 137-138).

322. OLD PALACE, RAMNAGAR, DISTRICT UDHAMPUR

Structural repairs by way of random rubble masonry, plastering and pointing in combination mortar were carried out inside the palace area.

THRISSUR CIRCLES

KERALA

323. FORT ST. ANGELO, CANNANORE, DISTRICT CANNANORE

To arrest the leakage of water in the double volted roof of the horse stables, the dead weight consisting of degenerated lime-mortar and bricks were dismantled and the original shape was restored. The cracks over the roof were grouted and stitched. The inner and outer walls were plastered with lime-mortar.

324. BEKAL FORT, PALLIKARE, DISTRICT KASARGOD

The fallen part of north fort was reconstructed with laterite blocks.

325. FORT, PALAKKAD, DISTRICT PALAKKAD

The accretionary wall of the office building was dismantled and the original pillared *mandapa* was restored to its original shape.

326. SIVA TEMPLE, NETRIMANGALAM, DISTRICT PALAKKAD

The fallen eastern *prakara* wall was reconstructed as per the original.

327. FORT AT ANJENGO, DISTRICT THIRUVANANTHAPURAM

A dwarf wall with fencing was provided in the southern side of the monument to prevent encroachment.

328. PARASURAMA TEMPLE, THIRUVALLAM, DISTRICT THIRUVANANHAPURAM

To arrest the leakage in the northern cloistred *prakara* the dead load was removed and the original shape of the roof was restored. The terrace was watertightened with brickbats and lime-mortar and covered with pressed tiles (pls. 139-140).

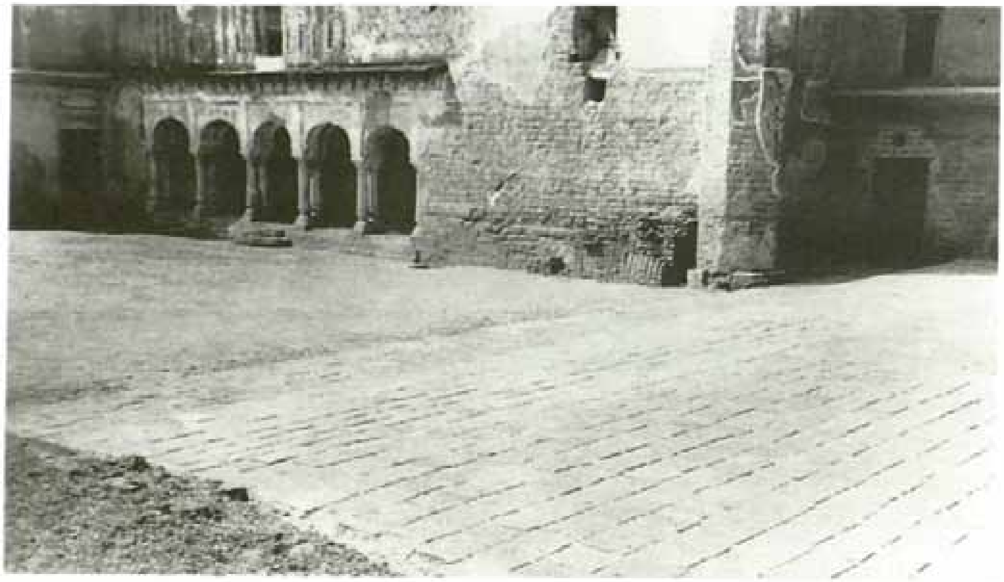
329. SIVA TEMPLE, CHEMMANTHITTA, DISTRICT THRISSUR

The out-of-plumb *prakara* wall was reset by dismantling and reconstructing it wherever required and the original shane of *gqjaprishta* was restored.

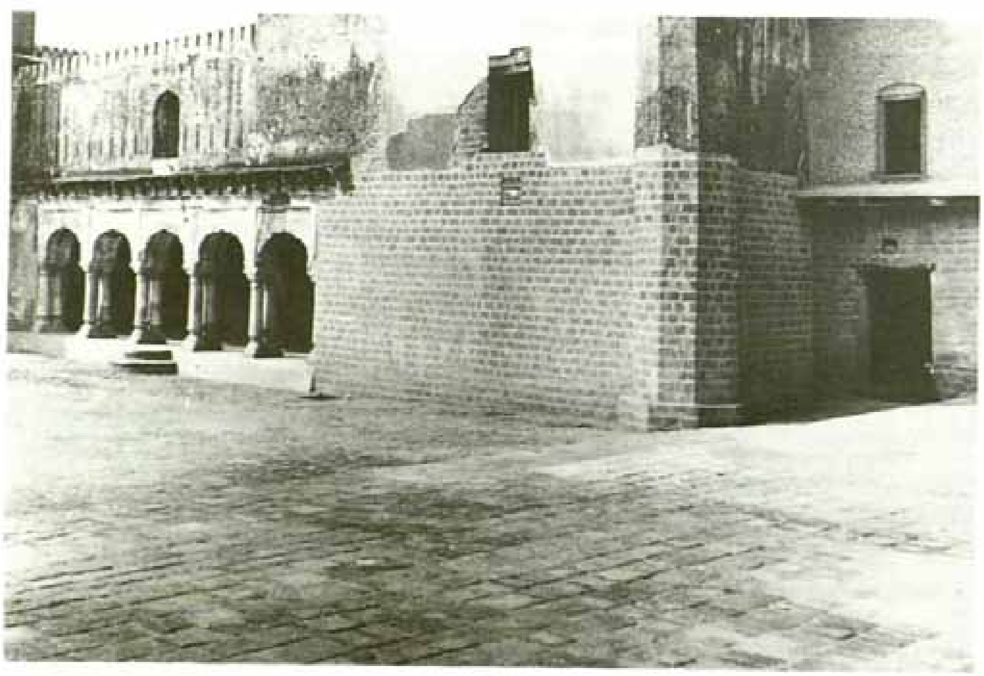
330. SIVA TEMPLE, PERUVANAM, DISTRICT THRISSUR

The northern and eastern Chuttambalam were conserved by replacing the worn-out decayed wooden beams, wall plates with fresh teak wood beams and wall plates.

Plates 137-138



137



138

Udhampur, Nawa Mahal, Ramnagar : 137, *before and* 138, *after conservation*

Plates 139-140



139



140

Parasurama, Matsya, Brahma and Siva Temples, Thiruvallam : 139, *before* *and* 140, *after conservation*

331. SIVA TEMPLE, THIRUVANCHIKULAM, DISTRICT THRISSUR

The Vimana of the Srikoil (sanctum) was conserved by replacing the damaged wooden rafters and corroded copper tiles with fresh teak wood rafters and new copper tiles respectively. The wall of the sanctum was preserved by restoring the damaged pilasters with lime-plaster as per the original.

332. THENKAILASANATHA TEMPLE, THRISSUR, DISTRICT THRISSUR

The decayed and damaged wooden beams and ceiling of the top two tiers of the southern *gopura* were replaced with fresh teak wood (pis. 141 -143).

333. JAINA TEMPLE, KIDANGANAD, SULTAN BATHERY, DISTRICT WYNAD

The sunken plinth of the northern *prakara, mandapa* was reset with available architectural members. An apron with stone slab was provided to arrest water percolation into the foundation.

VADODARA CIRCLE

DAMAN AND DIU

334. CHAPEL OF OUR LADY ROSARIO, MOTI DAMAN, DAMAN

In continuation of the last year's work *(1997-98,* p.326), the Mangalore tiled roof of the chapel was dismantled and useful tiles and wooden members were stacked for reuse. The useful wooden members were treated with two coats of wood preservative and reset in their original position. The damaged and decayed wooden members were replaced with fresh Bulsar teak wood and Mangalore tiled roof was relaid over new batons. The top of the walls was made watertight and dead plaster on outer surface of western wall was removed and replastered matching the original. The work is still in progress.

335. CHURCH OF OUR LADY REMEDIOS, MOTI DAMAN, DAMAN

In continuation of the last year's work *(1997-98,* p.326), the damaged and decayed concrete of platform was replaced with a fresh lime-cement concrete. The damaged and broken stone and brick benches were repaired. The interior was painted with distemper and exterior with white and colour wash. The wooden doors and windows were also painted with one coat of wood preservative and two coats of enamel paint. The work was completed.

336. FORTWALL (ARTILLERY BUILDING), MOTI DAMAN, DAMAN

The damaged and decayed roof concrete was dismantled and removed. The wooden planks of roof were also removed. The decayed and damaged wooden members of roof were replaced with new wooden members and roof was relaid with wooden planks followed by a layer of fresh lime-cement to arrest water leakage. The collapsed portion of wall was reconstructed and missing roof was also laid on heavy wooden beams with plain lime-cement-concrete flooring and terrace. The decayed and damaged plaster of the exterior walls was replaced with fresh lime-cement plaster as per original. The decayed and damaged doors and windows were replaced with fresh wooden doors and windows. The work was completed.

337. RUINED CHURCH, MOTI DAMAN, DAMAN

The area around the Chruch was enclosed with brick masonry dwarf wall mounted with chain link

Plate 141



141

Thenkailasanatha Temple, Thrissur : before conservation of southern gopuram

Plate 142



142

Thenkailasanatha Temple, Thrissur : during conservation of southern gopuram

Plate 143



143

Thenkailasanatha Temple, Thrissur : after conservation of southern gop:ıram

fencing in angle iron frames to avoid encroachment and development of the protected area by laying of garden through Horticulture Branch. An M.S. gill gate was also provided. All the ironwork of the chain link fencing and M.S. grill gate were painted with one coat of steel primer and two coats of enamel paint. The work was completed.

338. STRUCTURES (AMMUNITION STORE), MOTI DAMAN, DAMAN

The old, damaged and decayed cement-concrete approach road of Ammunition store constructed during Portuguese time was reconditioned by laying a layer of stone ballast and finished with a layer of fresh cement-concrete for easy movement of tourists. Uncoursed stone masonry pedestals were erected for placing the Portuguese canons. The store building was given a face lift by painting the interior by distemper and exterior with white and colour wash. Door and windows were painted with enamel paint. The work was completed.

339. FORT AND INSIDE BUILDINGS, DIU

In continuation of the last year's work *(1997-98,* p.327), the decayed and worn-out bela stones of the fort wall were taken out and replaced with fresh finely chiselled dressed bela stones. The approach pathway to the top of bastion was reconditioned by laying fresh chisel dressed -bela stones on the pavement for easy movement of tourists including filling up the joints of the stone on the pavement. The decayed and damaged stone steps of jetty were replaced with fine chisel-dressed bela stones including pointing in lime-cement mortar. The exterior and interior walls of the general mess were replastered with lime-cement-mortar and interiors were painted with distemper and exterior with colour wash. Damaged doors and windows were replaced with fresh wooden doors, painted with a coat of wood-primer and two coats of enamel paint. The work is still in progress.

GUJARAT

340. MOSQUE OF AHMED SHAH, AHMEDABAD, DISTRICT AHMEDABAD

The decayed, damaged and worn-out architectural members and veneering ashlar stones of the facade of the mosque were carefully removed by way of chiselling in patches, retaining the unaffected stone members undisturbed. The exact size of architectural members and veneering ashlar stones were dressed with necessary carvings and mouldings as per original matching with colour and texture. The dressed-stones were inserted in the structure and binded with lime-cement-mortar to hold them in position. The damaged and decayed roof concrete of terrace and domes were replaced with lime-cement-concrete afresh and finished, matching the original, to make the roof-terrace and domes watertight. The work was completed.

341. BRICK MINAR, RAILWAY PLATFORM NO. 1 AHMEDABAD, DISTRICT AHMEDABAD

In continuation of the last year's work *(1997-98,* p.321), the weathered, damaged and missing intricately and artistically carved different sizes ofburnt bricks of the lower parts of the Minars were replaced with specially manufactured brick of original size matching in colour and texture, with moulded work by skilled masons imported from Rajasthan, in conformity with the original as per existing specimen in lime-cement-mortar. The work was completed.

342. KALUPUR GATE, AHMEDABAD, DISTRICT AHMEDABAD

In continuation of the last year's work *(1997-98,* p. 321), the decayed and deteriorated veneering

stone masonry on southern and western sides of the gate was dismantled carefully after detailed documentation, numbering and photo-documentation together with the adjoining brick masonry hearting and stacked the dismantled stones properly for reuse in restoration. The ashlar stone veneering and brick masonry hearting were restored with lime-cement mortar after replacing the damaged and decayed veneering stones with fine chisel-dressed ashlar stones with carvings and mouldings matching the original. Decayed and damaged pilaster bases, brackets, etc. were also replaced with chisel-dressed pilaster bases and brackets, etc. as per original. The disturbed brick masonry on the top of the gate was dismantled and reconstructed in lime-cement-mortar in plumb and alignment. The decayed concrete of roof terrace was also removed and relaid with fresh lime-cement-concrete with proper slope for watertightening the roof. The work was completed.

343. MOSQUE OF RANI SIPRI, AHMEDABAD, DISTRICT AHMEDABAD

In continuation of the last year's work *{1997-98,* p. 322), the damaged and uneven stone flight of steps leading to the mosque and courtyard floring were replaced with newly chisel-dressed Dhragandhara stones over a layer of lime-concrete maintaining the original pattern of the flooring. The work was completed.

344. PREMABHAI GATE, AHMEDABAD, DISTRICT AHMEDABAD

In continuation of the last year's work *(1997-98,* p. 321), the decayed and damaged veneering stone masonry was replaced with fine chisel dressed Dhragandhara stone masonry to match with the original after carving and moulding set in lime-cement-mortar. The decayed and damaged lime-concrete of roof-terrace was also replaced with fresh lime-concrete to make the roof watertight. The work was completed.

345. JAMI MASJID, MANDAL, DISTRICT AHMEDABAD

The cracked, broken and decayed stone lintels, pillars and roof slabs were replaced with fresh fine chisel-dressed stone lintels, pillars and roof slabs. The front wall was pointed and plastered as per original and roof-terrace was made watertight. The work is in progress.

346. MONUMENTS AT SARKHEJ, DISTRICT AHMEDABAD

The damaged and decayed stone flooring and flight of steps between tomb of Mahmud Begra and tomb of Raj Bibi (Sarkhej) were replaced with fresh fine chisel-dressed stones as per original. The work was completed.

347. MANSAR TALAV AND SHRINES, VIRAMGAM, DISTRICT AHMEDABAD

The sunk/dislocated steps along with the paved embankments were dismantled and reset in proper alignment including hearting masonry in lime-cement mortar as per original. The work is still in progress.

348. CITADEL WAIX, PAVAGADH, DISTRICT GODHRA

In continuation of the last year' work *(1997-98.* p. 322), the bulged-out portion of the bastion of citadel wall in front of machi road was dismantled after proper documentation and numbered carefully and reconstructed in plumb and alignment in LCM as per original. Some of the fallen stone members were retrieved and reused in restoration of the same.

349. JAMI MASJID, PAVAGADH, DISTRICT GODHRA

The missing stone pilasters of windows, lintels and *chhajjas* on the south-east comer of the courtyard

of the mosque were restored with fresh fine chisel-dressed stone pilasters in LCM, with original carvings and mouldings. The work is still in progress.

350. LAKULISA TEMPLE, PAVAGADH, DISTRICT GODHRA

An approach pathway was provided to the temple by cutting slope and levelling the ground for easy approach and the temple was made watertight. The work is in progress.

351. MANDVI GATE, PAVAGADH, DISTRICT GODHRA

The missing ashlar stone masonry wall was restored as per available clues. The missing stone lintels and the arches were dressed and properly moulded to match with the original. The work is still in progress.

352. PANCH MAHUDA-KI-MASJID, HALOL, DISTRICT GODHRA

The richly-carved out-of-plumb stone Minaret was dismantled with the help of chain pulley block carefully after proper documentation, i.e., photography, numbering etc., upto foundation. The same was reconstructed after consolidating rubble stone hearting in LCM without changing its subtle features (pls. 144-146). The area was fenced with barbed-wire on angle iron posts. Restoration and repairs to the adjacent tomb is in progress.

353. VEM MADHAVA TEMPLE (DWARAKADHISH TEMPLE-COMPLEX), DWARKA, DISTRICT JAMNAGAR

In continuation of the last year's work *(1997-98,* p.322), the weather-worn stone *chhajjas* and *kanguras,* etc. of Veni Madhava Temple, were replaced with fresh fine chisel-dressed stone *chhajjas, kanguras,* etc., with original moulding and carving with the help of chain pulley block. The dome and roof terrace were relaid with fresh lime-concrete as per original. The work was completed (pls. 147-149).

354. MOKSHADVARA (DWARAKADHISH TEMPLE-COMPLEX), DWARKA, DISTRICT JAMNAGAR

The Mokshadvara was taken up for repairs by opening the filled portion above the wooden door and repairs of beams, slabs, brackets, *chhajjas* and roof-terrace. The existing small wooden door shutters were replaced with new teak wood door of original size and design in order to facilitate the entry of pilgrims. The decayed and damaged stone pavement was replaced partly with dressed limestone pavement. The work is still in progress.

355. JUNAGADH (JAINA) TEMPLE, VASAI, DISTRICT JAMNAGAR

Damaged and missing stone pavement on north side pavilion was replaced with fresh fine chisel-dressed stone pavement on lime-cement base as per original stone pavement. The work is still in progress.

356. RUKMINI TEMPLE, DWARKA, DISTRICT JAMNAGAR

Damaged random rubble stone masonry compound wall and ashlalr stone masonry pillars were carefully dismantled and useful material sorted out. These were properly reconstructed partly from the old sorted out material as per original. The work is still in progress.

357. EXCAVATED SITE, DHOLAVIRA, DISTRICT KACHCHH

In continuation of the last year's work *(1997-98,* p 323), the random rubble stone masonry structures (excavated remains) were underpinned, pointed and watertightened, in lime-cement-mortar matching the original.

358. RANI-KI-VAV, PATAN, DISTRICT PATAN

The damaged stones at the end of the side platform were replaced by fresh carved and moulded

Plates 144-145



144



145

Halol, Minar, Panch Mahuda-ki-Masjid : 144, *before and* 145, *during conservation*

Plate 146



146

Halol, Minar, Panch Mahuda-ki-Masjid : after conservation

Plates 147-148



147



148

Dwarka, Venimadhava Temple, Dwarkadhish Temple-complex : sabha-mandapa,
147, *before and* 148, *during conservation*

Plate 149



149

Dwarka, Venimadhava Temple, Dwarkadhish Temple-complex : sabha-mandapa, after conservation

Plates 150-151



150



151

Surat, Old English Tomb : 150, *before and* 151, *during conservation*

Plate 152



Surat, Old English Tomb : after conservation

stones matching the original. Dressing of stones for replacement of damaged and decayed flooring stones remained in progress.

359. NILKANTHESVARA MAHADEVA TEMPLE, SIJNAK, DISTRICT PATAN

The missing ashlar masonry was replaced with fresh fine chisel-dressed and carved stones matching the original. The damaged stone steps and other carved and moulded stone members were also replaced with fresh chisel-dressed stones, matching the original. The work was completed.

360. SHIVAI MATA TEMPLE, SUNAK, DISTRICT PATAN

The stone masonry dwarf wall was constructed along the tank in order to stop further erosion of temple base and surroundings. The work of stone pitching remained in progress.

361. OLD ENGLISH TOMBS, SLRAT, DISTRICT SURAT

The decayed and damaged plaster of the dome, ceiling and walls was removed and fresh lime-plaster was provided to the dome, ceiling and walls after filling of cavities, including moulding in plaster as per original. The work remained in progress (pls. 150-152).

362. HIRA GATE, DABHOI, DISTRICT VADODARA

The decayed lime-plaster from the walls, gateway, terrace, parapet was removed and replastered with moulding and finishing work. GI barbed-wire fencing was provided along the roadside to prevent encroachment. The work remained in progress.

363. ANCIENT SITE, KAYAVAROHAN, DISTRICT VADODARA

The ancient brick masonry of the excavated remains and temple plinth was reset and strengthened. New bricks of original pattern and size were provided in place of missing and decayed ones. Pointing and watertightening of the entire structures were done. Colour pigment was used in order to match it with the original one. The work remained in progress.

364. HAZIRA OR QUTBUDDIN MOHMAD KHAN'S TOMB, VADODARA, DISTRICT VADODARA

Damaged and decayed lime-plaster of the wall of small gates were removed and replastered as per original. Brick and stone masonry arches of the octagonal tomb were also attended to for the removal of decayed lime-plaster and replastered afresh as per original with the stucco works. Pointing of the joints were also attended to. A lightning conductor was provided. Approach pathway on concrete base with Dhragandhra sandstone including dressing and cutting is in progress (pls. 153-154).

MONUMENTS MAINTAINED BY STATES

ANDHRA PRADESH

365. The Department of Archaeology and Museums, Government of Andhra Pradesh, carried out conservation work at Khulsum Begum's Tomb, Choukhandis on south-west side, Hayat Baksh Begum's Mosque and Tomb; Tombs of Sultan Quli and Jamshed Quli besides laying gardens inside the Tomb-complex of Quli Qutub Shah; Baradari of Taramati and Badsha-e-Ashurkhana near Madina, during the period under review.

ARUNACHAL PRADESH

366. SOUTHERN GATE, ITA FORT

Structural conservation was conducted at the southern gate, Ita Fort by the Directorate of Research, Government of Arunachal Pradesh (pls. 155-156). The fort is situated in the heart of capital town of Itanagar which is named after this brick fort.

Plates 153-154



154



153

Vadodara, Hajira or Qutbuddin Mohmad Khan's Tomb : 153, *before and* 154, *after conservation*

Plate 155



Ita Fort southern gate, before conservation

VIII. ARCHAEOLOGICAL CHEMISTRY

TREATMENT OF MONUMENTS AND PAINTINGS[1]

ANDHRA PRADESH

1. SRI VIRABHADRASVAMY TEMPLE, LEPAKSHI, DISTRICT ANANTAPUR

In continuation of the previous year *(1997-98,* p. 328), the work of chemical treatment and preservation of paintings of the main temple, the consolidation and filleting of the painted panel was attended to.

2. SRI KUMARARAMA BHIMESVARASVAMY TEMPLE, SAMALKOT, DISTRICT EAST GODAVARI

The chemical treatment work was continued during the year for the removal of micro- vegetational growth and lime-wash coats from the stone surface using dilute solution of aqueous ammonia and teepol (3:1). The lime-wash accretionary coats were removed by physico-chemical means using 5% acetic acid. The chemically cleaned areas were given fungicide coat of 2% sodium penta chlorophenate and finally the dried surface was preserved with Gujpol (PMMA) solution in toluene. The work has been completed (pls. 157-158).

3. CHARMINAR, DISTRICT HYDERABAD

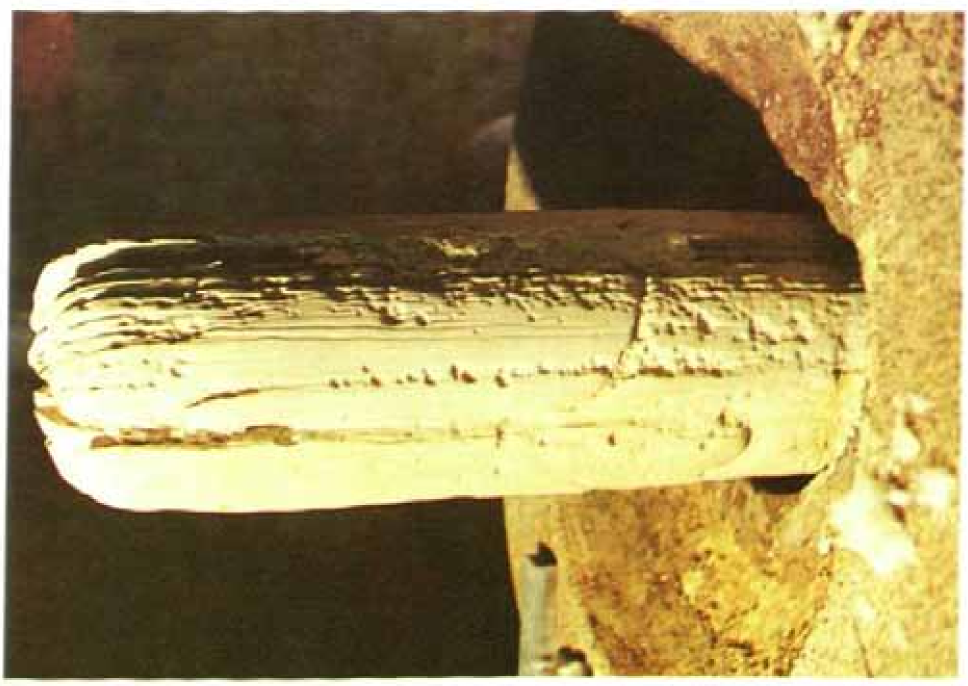
The chemical treatment work in north-west and south-west Minarets, connecting walls and Masjid initiated during the last year was continued for the removal of thick growth of micro-vegetation and heavy accumulation of dust and dirt at some places deposited on the lime-plaster. The micro-vegetational growth was removed using aqueous ammonia and non ionic detergent in 3:1 ratio with the help of very soft brushes taking care of the sheen of the lime-plaster so that the same is not affected. After chemical cleaning, fungicidal treatment with 1 % solution of sodium penta chlorophenate was carried out. The cleaned and plastered surface was then preserved using two component systems with aqueous solution of Repellin super in desired concentration and a coat of 2-3% PMMA in toluene on the completely dried surface. During the period under review, about 740 sq mtr area was chemically treated and preserved (pls. 159-160).

In addition to the above referred minarets, the chemical treatment and conservation work was taken up during this year on north-east and north-west minarets along with their connecting wall upto masjid floor level by adopting the same procedure. An area of 680 sq m of the plastered surface was chemically treated and preserved at this level during the period under review.

---

[1]Information from : Director (Science), Dehradun, of the Survey

Plates 157-158



157



158

Linga, Sri Kumararama Bheemesvarasvamy Temple, Samalkot : 157, before and 158, after consolidation

Plates 159-160



160



159

Minaret, Charminar, Hyderabad : 159, *before and* 160, *after removal of micro-vegetational growth*

4. NAVABRAHMA TEMPLES (GARUDA BRAHMESVARA AND KUMARA BRAHMESVARA), ALAMPUR, DISTRICT MAHABOOBNAGAR

The chemical conservation work in this temple complex was taken up on Garuda Brahmesvara and Kumara Brahmesvara Temples. The chemical treatment work involved the removal of thick lime wash coats from the interior of these temples by physico-chemical means using 5% acetic acid. The work is in progress.

5. SRI MUKHALINGESVARASVAMY TEMPLE, SRIMUKHALINGAM, DISTRICT SRIKAKULAM

The work was continued during the year for the removal of thick growth of moss and lichen as well as deposits of lime coat from the main *sikhara* of the temple. The micro-vegetational growth was removed using mixture of ammonia and teepol whereas the lime wash coatings were removed with 5-7% aqueous solution of acetic acid. The areas chemically cleaned with acetic acid were neutralized with very dilute solution of ammonia followed by thorough washing for the removal of any residual chemicals form the surface. The chemically cleaned surfaces were given fungicidal and preservative treatment. During the period under review approximately an area of 740 sq m was chemically treated and preserved and the work was completed.

6. SRI SOMESVARA TEMPLE, SRIMUKHALINGAM, DISTRICT SRIKAKULAM

The chemical conservation work was mainly carried out for the removal of micro-vegetational growth and lime-wash coats from some places. The chemical treatment and preservation work was carried out as detailed above for Srimukhalingesvarasvamy Temple. The preservation of stone surface was carried out using double component system, i.e., 2% Repellin super followed by 2% PMMA in toluene (pls. 161-162).

BIHAR

7. EXCAVATED SITE, KOLHUA, DISTRICT MUZAFFARPUR

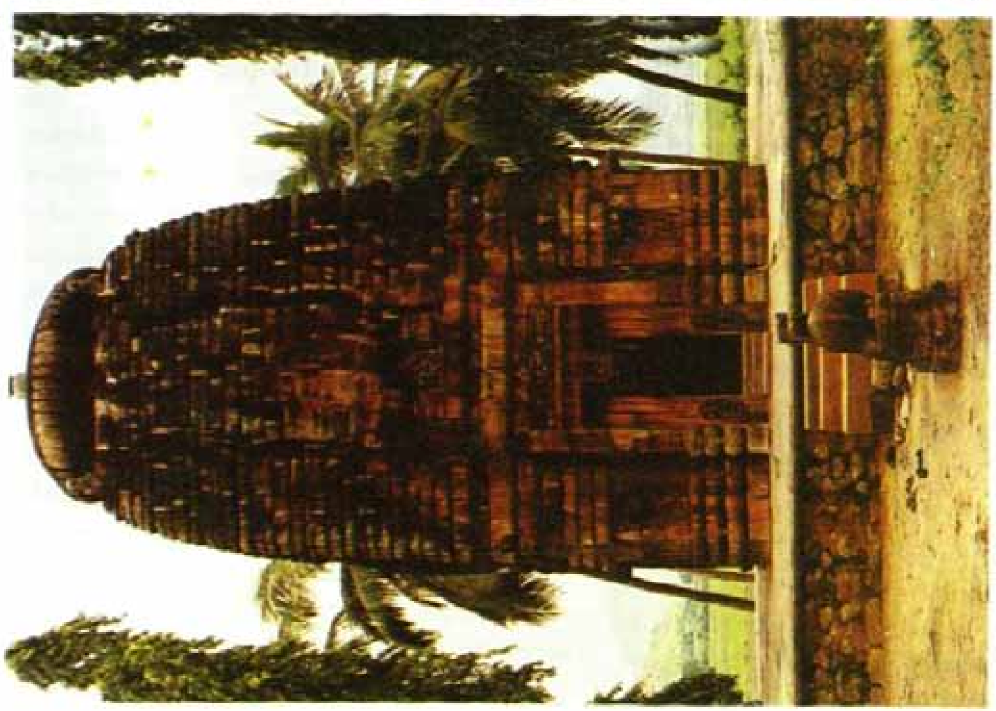
The brick structure of the excavated site covered with thick layer of dust, dirt and micro-vegetational growth were subjected to chemical treatment using 5% aqueous solution of ammonia and 1% solution of non-ionic detergent with soft brushes. The chemically cleaned surface was subjected to fungicidal treatment with 5% solution of sodium pentachlorophenate and finally preserved with double component system using 2% solution of Repellin super followed by 2% solution of PMMA in toluene after a gap of fortnight on dried surface.

DELHI

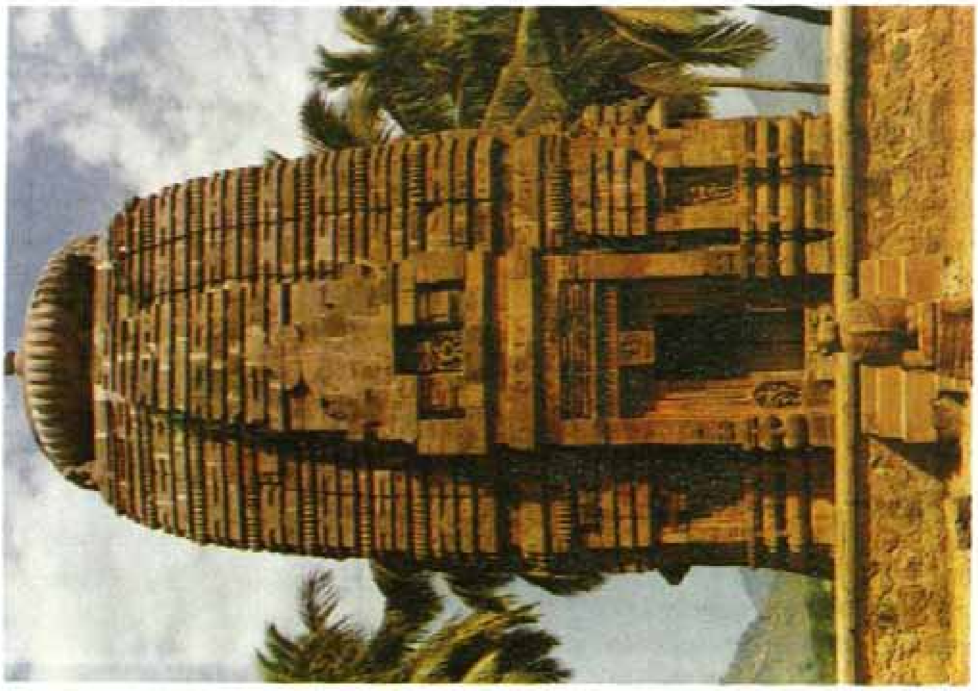
8. RED FORT-COMPLEX, DELHI

The process of exposing the paintings in Hamam hidden under thick lime-wash coats was carried out during the period under review. After the removal of superficial dust from these areas, the painted plaster was consolidated by filleting and other means. The loosened lime coats were mechanically removed and tenaciously adhering remnants of these lime coats were given localized treatment with very dilute acetic acid, covering a very small area at a time. Utmost care was taken to ensure that effect of acetic acid was confined only to the lime-wash coat. After the removal of lime coats, the exposed painted surface was chemically cleaned with suitable organic solvents like methyl alcohol, benzene, triethanolamine and their mixtures in suitable proportions as per the actual

Plates 161-162



161



162

Sri Somesvarasvamy Temple, Srimukhalingam : view from west, 161, before and 162, after chemical treatment

requirement as observed during chemical cleaning work. Finally, the paintings were preserved with 2% solution of polyvinyl acetate in toluene.

The chemical conservation work on different parts of this Moti Masjid comprising metallic pinnacles, marble surface, lime-plastered outer walls and sandstone areas of perforatedya// was taken up. The metallic pinnacles, tarnished due to atmospheric exposure, were chemically cleaned with solution of alkaline Rochell's salt without removing the stable oxidized patina. The marble surface was first chemically treated with dilute solution of teepol and ammonia to remove superficial dust and dirt. Thereafter, for the removal of greasy matter and adherent accretionary deposits from the marble surface, treatment with clay pack method using Fuller's earth mixed with sodium carbonate and sodium bi-carbonate was carried out. The meticulously designed sandstone *jali,* staircase leading to the top of the masj id, four outer walls having lime-plaster were also chemically treated with mixture of aqueous solution of ammonia and teepol. The sandstone and lime plastered surfaces were given fimgicidal treatment and finally preserved with 5% solution of Repellin super (Potassium methyl siliconate).

As in previous year before 15 August, the chemical treatment of three-sided rampart wall under Flag Mast facing Chandni Chowk was taken up for the removal of superficial accretionary deposits of dust, dirt, micro-vegetational growth and pollutants etc. The metallic pinnacles made of brass were also chemically cleaned and preserved. Besides, the two stone elephants located at Delhi Gate, Red Fort were chemically cleaned for the removal of dust, dirt and stains due to bird's excreta etc.

9. Bada Gumbad Mosque, Lodi Garden, New Delhi

The plastered surface of exterior and interior of the mosque comprising an area of 1100 sq m was chemically treated during the period under review using solution of suitable chemicals *viz.,* aqueous ammonia solution, non ionic detergent and calcium oxychloride slurry. Fungicidal and preservative treatments were given on the completely dried surface.

10. Jamali Kamali, Mehrauli, New Delhi

The exterior of a room housing graves (comprising an area of 420 sq m) was subjected to chemical treatment for the removal of dust, dirt, micro-vegetational growth and other accretionary deposits using suitable chemicals. Fungicidal treatment was given with 2% solution of sodium pentachlorophenate followed by water repellent treatment with Repellin super over the dried surface. The work was completed during the period under review.

11. Gateway of Arab-ki-Sarai, Nizamuddin, New Delhi

The chemical treatment work was taken up on the exterior side of the eastern wall of the gateway. The superficial accretionary deposits of dust, dirt, etc., were removed with mixture of ammonia and teepol solution using very soft brushes to prevent any abrasive action on the plastered surface. The treated surface was further subjected to the application of Calcium oxychloride slurry for complete eradication ofbryophytes. Finally, the chemically cleaned surface was given fungicidal treatment and preservative coat.

12. Humayun's Tomb, Nizamuddin, New Delhi

During the period under review, the chemical treatment work was carried out for the removal of

superficial layers of dust, dirt and other accretionary deposits from the plastered surface of four *chhattris* on the roof-top of the tomb. The calcium oxychloride treatment was also carried out followed by fungicidal and water repellent treatments.

13. ISAKHAN'S TOMB, NIZAMUDDIN, NEW DELHI

The lime-plastered surface of the exterior of the dome, *kangoora, chhattri,* small minarets, etc., were subjected to chemical treatment using mixture of ammonia and teepol solution. Thereafter, the fragile areas were consolidated and the lime-plastered areas were once again subjected to chemical treatment using Calcium oxychloride slurry in two applications. The chemically cleaned areas were then given fungicidal treatment using sodium pentachlorophenate and preserved with Repellin super as water repellent.

14. QAL'A-I-KUHNA MOSQUE, PURANA QILA, NEW DELHI

Chemical treatment and preservation work was carried out on the exterior of dome, *kangooras* facing south (main entrance gate) and pinnacles made of sandstone and lime-plaster comprising an area of 735 sq m. The surface was chemically cleaned with solution of ammonia and teepol after dry brushing. Solution of sodium pentachlorophenate was sprayed as fungicide followed by water repellent treatment with Repellin super on sandstone and lime-plaster surfaces.

15. BASILLICA OF BOM JESUS, VELHA GOA

The exterior north wall and buttress wall built of laterite stone blocks having thick growth of micro-vegetation and other accretionary deposits were subjected to chemical treatment using aqueous solution of ammonia and non ionic detergent (pls. 163-164).

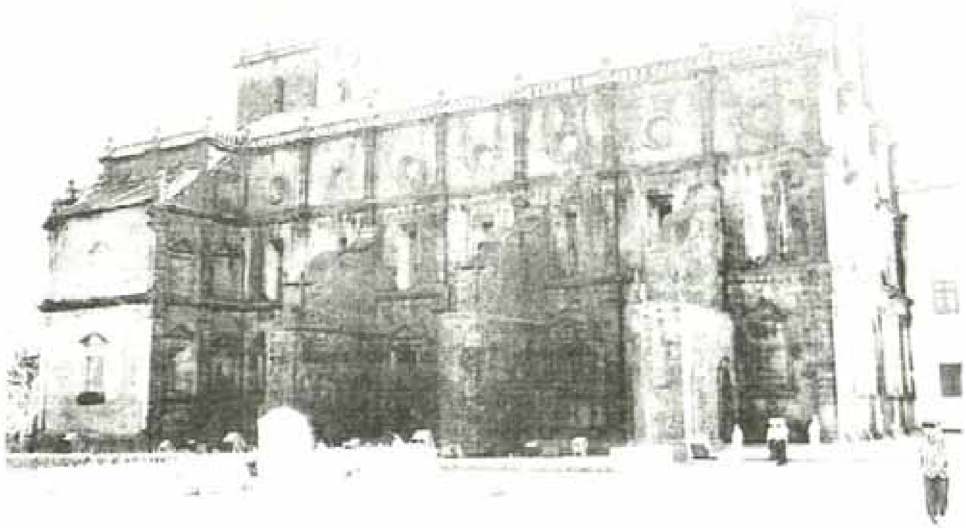
Wherever necessary, the pointing of stone blocks was corrected and matched with the old existing pointing. The chemically treated surface was given fungicidal treatment with 2% aqueous solution of sodium pentachlorophenate and final ly preserved by application of 3% solution of PMMA in toluene. About 2400 sq m area was chemically cleaned and preserved.

16. CHURCH OF ST. FRANCIS OF ASSISI, VELHA GOA

The wooden panel paintings and their carved wooden frames were in a very poor state especially as a result of insect attack and deposition of thick layers of dust, dirt, bird's excreta and darkening due to old preservative layer. Due to insect activity, at many places, the wooden panels had become hollow from inside and as such this problem was not visible when observed from the painted side.

Firstly, the dust and dirt superficially deposited on painted surface were removed by gentle brushing. The insect eaten portion was treated with pyrethrum and then these cavities as well as minor gaps between wooden panels were filled up with composite mixture of saw dust, lime powder, acrylic resin and insecticide additive. The adherent accretionary deposits and old darkened preservative coats were removed using organic solvents like cellosolve, di-acetone alcohol, iso-propyl alcohol, methanoal and petroleum spirit in different combinations as per the response of accretionary deposits. The filled up areas were colour matched with oil colours in toned down effect and finally a thin layer of picture varnish was applied. The intricately carved wooden frames of these panel paintings, after general cleaning were given a coat of

Plates 163-164



163



164

Exterior view of Basillica of Bom Jesus, Velha Goa : 163, *before and* 164, *after chemical treatment*

2% solution of polyviny acetate in toluene. The work was completed.

17. SE-CATHEDRAL CHURCH, VELHA GOA

The chemical conservation work in this cathedral comprised chemical treatment and preservation of wooden panel paintings, gilded wooden carvings and polychrome sculptures of altars of Our Lady of three Necessity and marble sculptures of this church. The wooden panels of some of the paintings, gilded wooden carvings and polychrome sculptures were badly affected by insect activity to the extent that at some places the wooden part had been eaten away and damaged in such a fashion that only a thin layer of the painted surface was precariously left as a loose part. The darkening of old preservative, obliterated the fine details of the painting.

The chemical conservation work of wooden panel paintings, polychrome sculptures and gilded wooden carvings was carried out in different steps as per the process already detailed for such objects of St. Francis Church.

The marble sculptures inside the church were mainly stained with brownish patches, and lime splashes. The beautiful statue of Jesus on a marble pedestal in front of the main entrance was affected by micro-vegetational growth, deposition of dust, dirt, bird's excreta, wax and soot etc. These sculptures were cleaned using a mixture of aqueous ammonia and teepol solution. After the removal of superficial accretionary deposits, the adherent deposits were removed by using bentonite clay pack treatment. After cleaning and thorough washing, these marble sculptures were burnished with a swab of soft cotton cloth. The conservation work of gilded wooden objects and panel paintings would continue during the next year.

GUJARAT

18. JAMI MASJID, PAVAGADH, DISTRICT GODHRA

Chemical treatment and preservation work on this beautiful shrine was carried out for eradication of thick biological growth, remains of lime-wash, dust, dirt, bird's excreta etc, using suitable chemicals and solvents.

19. NAGINA MASJID, PAVAGADH, DISTRICT GODHRA

The chemical conservation work on this monument situated in the dense forest of Pavagadh hills was taken up mainly for the removal of micro-vegetational growth using mixture of ammonia and teepol solution. The whole surface was given fungicidal and preservative coat.

20. THREE CELLS AND CUSTOM HOUSE, PAVAGADH, DISTRICT GODHRA

The chemical treatment work in this structure was continued for the removal of accretionary deposits, fungicidal treatment and application of preservative coat.

21. SUN TEMPLE, MODHERA, DISTRICT MAHESANA

The sculptures and carvings on the exterior part of this temple covered with dust, dirt and biological growth were subjected to chemical treatment using mixture of ammonia-teepol solution. Cleaned surface was given fungicidal treatment by spraying 2% suspension of zinc silicofluoride in water. Finally, the preservative coat of 3% solution of PMMA in toluene was applied on the dried surface.

22. ARMENIAN CEMETERIS AND REMAINS OF DUTCH CEMETERIES, DISTRICT SURAT

The chemical treatment for the removal of thick biological growth, dust, dirt and pigeon droppings etc. was continued during the period under review. The fungicidal treatment and application of preservative coating were also carried out. The work was completed.

HIMACHALPRADESH

23. LAXMINARAYANA TEMPLE, CHAMBA, DISTRICT CHAMBA

The chemical treatment work was taken up on the main shrine of this temple during the period under review. It is reported that in the long past, there was a fire which too has contributed many of the stone conservation problems like exfoliation, pulverization, cracks, etc. Besides this, stone used in the reconstruction of the south-east portion being relatively of softer variety has also suffered significant weathering and contributed to defacing of such areas. The accretionary deposits of micro-vegetation, dust, dirt, soot and grease were removed by chemical treatment using mixture of non ionic wet agent with ammonia solution. Keeping in view the weathered stage of sandstone, only soft nylon brushes were used. After the removal of accretionary deposits, the entire area was thoroughly washed with water to ensure that no residual chemicals were left on the stone surface. The chemically cleaned surface was given fungicidal treatment. Finally on the dried surface two coats of 2% PMMA solution in toluene were applied.

24. NARBDESVARA TEMPLE, SUJANPUR, DISTRICT HAMIRPUR

This temple built in early ninth century has a treasure of Kangra mural paintings elaborately depicted on the ceiling and outer portion of the temple. The painted panels decorating the walls and ceilings, generally depict geometrical and floral designs, figures of birds and animals, mythological scenes, legends from epics. Being a living temple, lot of smoke, soot and oily matter emitted due to burning of oil lamps and incense sticks, were found accumulated on the painted panels inside the temple specially on the ceiling and other adjacent walls. On the outer side, the mural paintings were badly affected due to rain, splashes as also to some extent due to human vandalism.

The painstaking job for the removal of oil, soot and greasy matter from the painted surface was taken up by using mixture of organic solvents like methanol, amyl acetate, benzene, 2-ethoxy-ethanol, carbon-tetra-chloride, etc., in different proportions. Turpentine oil was also used either individually or in the mixture as a re-strainer depending upon the actual requirement as observed during the chemical treatment process.

As a final step of chemical cleaning, the entire surface subjected to chemical treatment was cleaned with methanol to remove the traces of other chemicals. Finally the cleaned mural surface was preserved with 0.5% solution of polyvinyl acetate in toluene.

25. GONKHANG GOMPHA, TABO, DISTRICT LAHALL AND SPITI

The *gompha* dedicated to the Tantrik sect of Buddhism is a subsidiary of Dukhang (Duwang) *gompha* and *zelma* of the Tabo monasteries complex. The walls and the ceiling of this small *gompha* are fully painted which were covered with deposition of dust, dirt, soot and oily matter. Besides, the vertical as well as the horizontal cracks,

bulging of painted plaster had further complicated the conservation problems. The lower portion of western wall badly affected due to water seepage and a big portion of the painted surface were found missing.

The chemical conservation work involved the filling up of the gaps, consolidation of the bulged portion and chemical cleaning of the painted surface for the removal of dust and dirt, soot and greasy matter using the mixture of organic solvents. The faded portion and filled in areas were colour matched in lighter tone. Finally, two coats'of 0.5% solution of polyvinyl acetate in toluene were applied over the cleaned surface with a view to preserve and consolidate the pigment layer.

KARNATAKA

26. HAZARA RAMACHANDRA TEMPLE, HAMPI, DISTRICT BELLARY

The chemical treatment and preservation work for eradication of micro-vegetational growth, lime wash, calcareous accretions etc., from stone sculptures of the interior and exterior of the main shrine, goddess shrine including the Vimana and *mantapas* was carried out using different chemicals/ solvents *viz.,* aqueous solution of ammonium hydroxide, non ionic detergent, glacial acetic acid and sodium hexametaphosphate. Finally, the stone surface was treated with fungicide followed by preservation with PMMA in toluene.

27. AHMAD SHAH WALI TOMB, ASTHUR, DISTRICT BIDAR

The chemical conservation work for consolidation of the friable pigments, filling of lacunae in rendering and filleting ofbroken edges of paintings as well as cleaning of the painted surface was carried out. The chemical cleaning involved the removal of superficial accretionary deposit, bird's dropping, bat's excreta etc., using mixture of solvents like 2-ethoxy ethanol, triethanolamine, turpentine. Finally, the cleaned painted areas were preserved with very dilute solution of PVA in toluene. The work will be continued during the next year.

28. GOMATESVARA STATUE AND THE ADJOINING MANTAPAS, SRAVANABELAGOLA, DISTRICT HASSAN

The work of consolidation of the bulgings on the left foot of the great statue was continued during the year as well. The affected portion was t! oroughly cleaned for the removal of oily stains and then ethyl silicate was injected into the holes of the bulges to stop flowing from the side opening or bottom which were sealed. The sealing of bulges was saturated through atmospheric moisture. The process of injecting ethyl silicate was repeated several times so as to fill the gaps completely.

29. DARIA DAULAT BAGH (NORTH VERANDAH), SRIRANGAPATNA, DISTRICT MANDYA

The chemical conservation work for consolidating the friable pigments and the rendering as well as chemical cleaning of the paintings of the ceiling and walls of the north verandah (inner and outer) and the anti-chambers (north-east and north-west) of this monument was taken up. During the period about 92 sq m area of the painting was consolidated, chemically cleaned and preserved after reintegrating the filled in gaps. The work will be continued during the following year.

30. RANGANATHSVAMY TEMPLE, SRIRANGAPATNA, DISTRICT MANDYA

The chemical cleaning of the sculptures and carvings in the interior of *arddha-mandapa,* circumbulatory passage, *mukha-mandapa* (exterior and interior), tower, small shrines with outer circumbulatory passage, was carried out for the removal of oily stains, soot and lime coat. Finally, the treated areas were preserved with 1% solution of acrypol -P-876 in toluene. The work is in progress.

31. TIPU SULTAN'S MAUSOLEUM, GUMBAZ, SRIRANGAPATNA, DISTRICT MANDYA

The paintings on the walls and door-jambs of the interior of mausoleum were chemically treated for removal of old yellowish translucent varnish coat. Consolidation work for filling in of lacunae, colour reintegration of the filled in lacunae was also carried out with suitable chemicals and materials. Finally, the preservative coat was applied over the painted surface.

KERALA

32. VADAKKUNATHAN TEMPLE, DISTRICT THRISSUR

Chemical conservation of paintings comprising an area of 187 sq m at different locations was carried out during the period. Dust, dirt, soot and smoke along with other accretions were removed with suitable organic solvents like triethanolamine, di-acetone alcohol, toluene and turpentine oil, etc. Consolidation of paints was done by plaster of Paris, fevicol and suitable matching with the surroundings. Preservative coat was applied using 1:5 solution of PVA in toluene.

Stone sculpture of ga/a-Lakshmi panel covered with thick lime-wash, were cleaned with 5% solution of acetic acid followed by a coat of preservative over the dried surface. From wood carvings, superficial deposits of dust, dirt, oily and sooty accretions were removed using different organic solvents. Flytox, a pyrethrum extract was applied as insecticide followed by preservation with 2.5% of PVA in toluene.

MADHYA PRADESH

33. CHATURBHUJA TEMPLE, KHAJURAHO, DISTRICT CHHATTARPUR

The chemical conservation work of this sandstone monument was taken up for eradication of deteriogenic organisms and other accretions from its exterior walls, adorned with exquisite carvings and sculptures. Chemical treatment and preservation of the north-west facing wall was carried out during the period. About 28% of the work was completed.

34. CHITRAGUPTA TEMPLE, KHAJURAHO, DISTRICT CHHATTARPUR

Chemical conservation work on the exterior, north facing wall of *maha-mandapa, mandapa* and entrance porch including *sikhara* was carried out for eradication of micro-vegetational growth, dust, dirt and other accretions. Tenacious lime-wash deposits were removed by chemico-mechanical method using dilute acetic acid solution. The cleaned surface was subjected to fungicidal treatment followed by preservation.

35. DEVI JAGADAMBI TEMPLE, KHAJURAHO, DISTRICT CHATTARPUR

In continuation of the previous year's *(1997-98,* p. 341) work, the chemical treatment and preservation

work of the temple were completed during the period. The stone surface comprising exterior walls of *maha-mandapa* and entrance porch were subjected to chemical treatment with suitable chemicals for the removal of dust, dirt, bird droppings and micro-vegetational growth etc. Lime accretionary deposits were removed with 5% solution of acetic acid followed by consolidation with synthetic resin. Fungicidal treatment was given to the surface followed by hydrophobic treatment with Pidicote WRS and 2% solution of PMMA in toluene (pls. 165-166).

36. KANDARIYA MAHADEVA TEMPLE, KHAJURAHO, DISTRICT CHHATTARPUR

The platform, terrace wall with carvings and sculptures of the main temple were subjected to chemical treatment and preservation with suitable chemicals. The work is in progress.

37. LAKSHMANA TEMPLE, KHAJURAHO, DISTRICT CHHATTARPUR

In continuation of the earlier (*1996-97,* p.310) work, four subsidiary shrines and platform, terrace wall with unique friezes were subjected to chemical treatment and preservation. About 62% of the work was completed during the period.

38. VARAHA, NANDI AND MAHADEVA SHRINES, KHAJURAHO, DISTRICT CHHATTARPUR

In the western group, the smallest shrines were chemically cleaned and preserved using suitable chemicals. The work will be continued during the following year.

39. VLSHVANATHA TEMPLE, KHAJURAHO, DISTRICT CHHATTARPIR

This temple having exquisite carvings and sculptures on its exterior walls was badly affected by thick growth of cryptogams and thereby obliterating the fine details. Exterior south-east facing walls of sanctum and *sikhara* were chemically cleaned with solution of aqueous ammonia, extran M A 02 (non ionic detergent) mixture in distilled water. After fungicidal treatment hydrophobic treatment with Pidicote WRS was given to the dried stone surface. About 49% of the work was completed.

40. SIVA TEMPLE, MOHATA, DISTRICT DAMOH

The stone surface of the monument was chemically treated and preserved during the period. The micro-vegetational growth with other accretions were eradicated by suitable chemicals using soft brushes. About 47% of the work was completed.

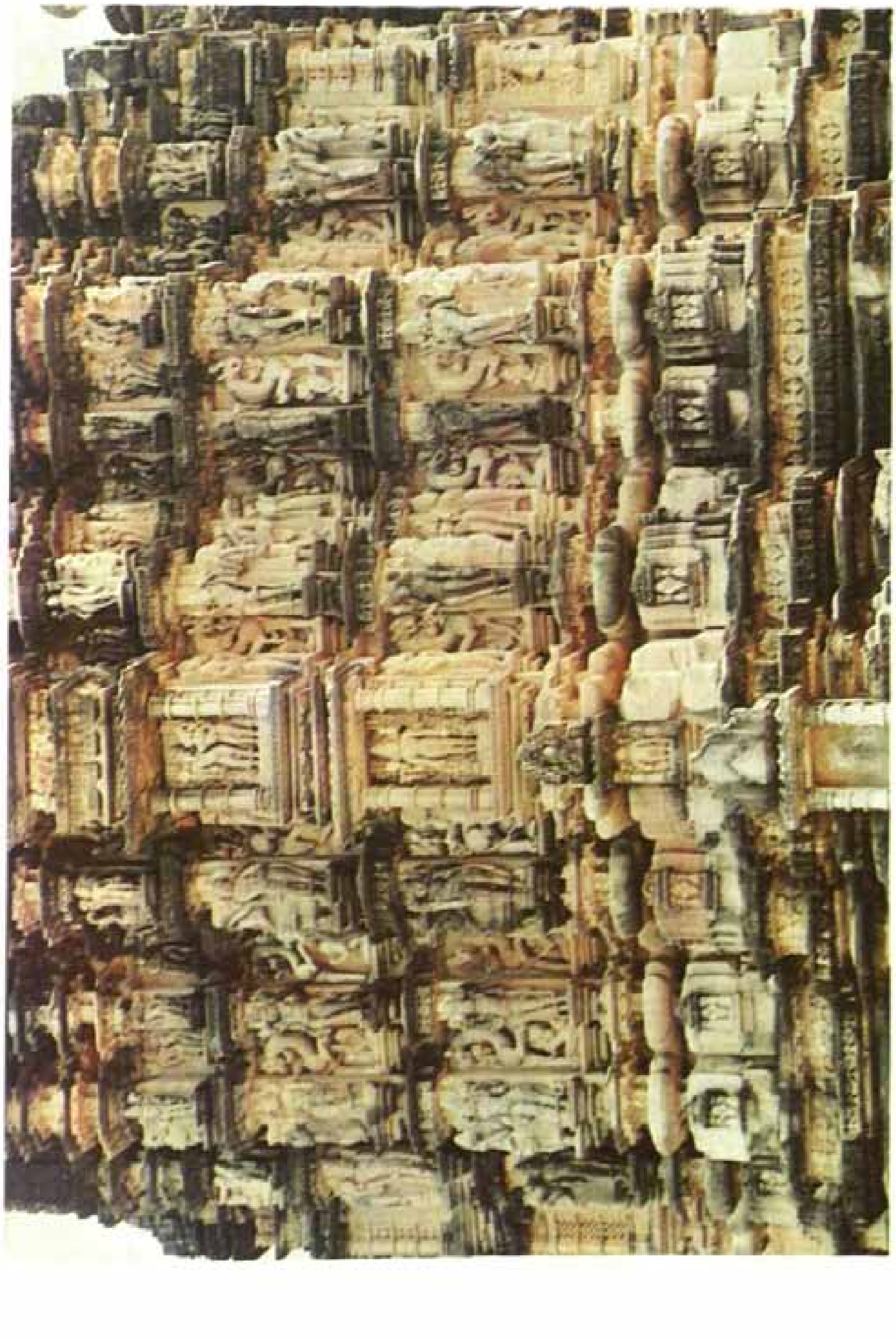
41. RAJA BIR SINGH DEO PALACE, DATIA, DISTRICT DATIA

In continuation of the previous year's *(1997-98,* p. 340) work, the chemical conservation of the wall paintings of Maharani's bedroom was continued. About 20.5% of the work was completed during the period.

42. ROCK-CUT CAVES, BAGH, DISTRICT DHAR

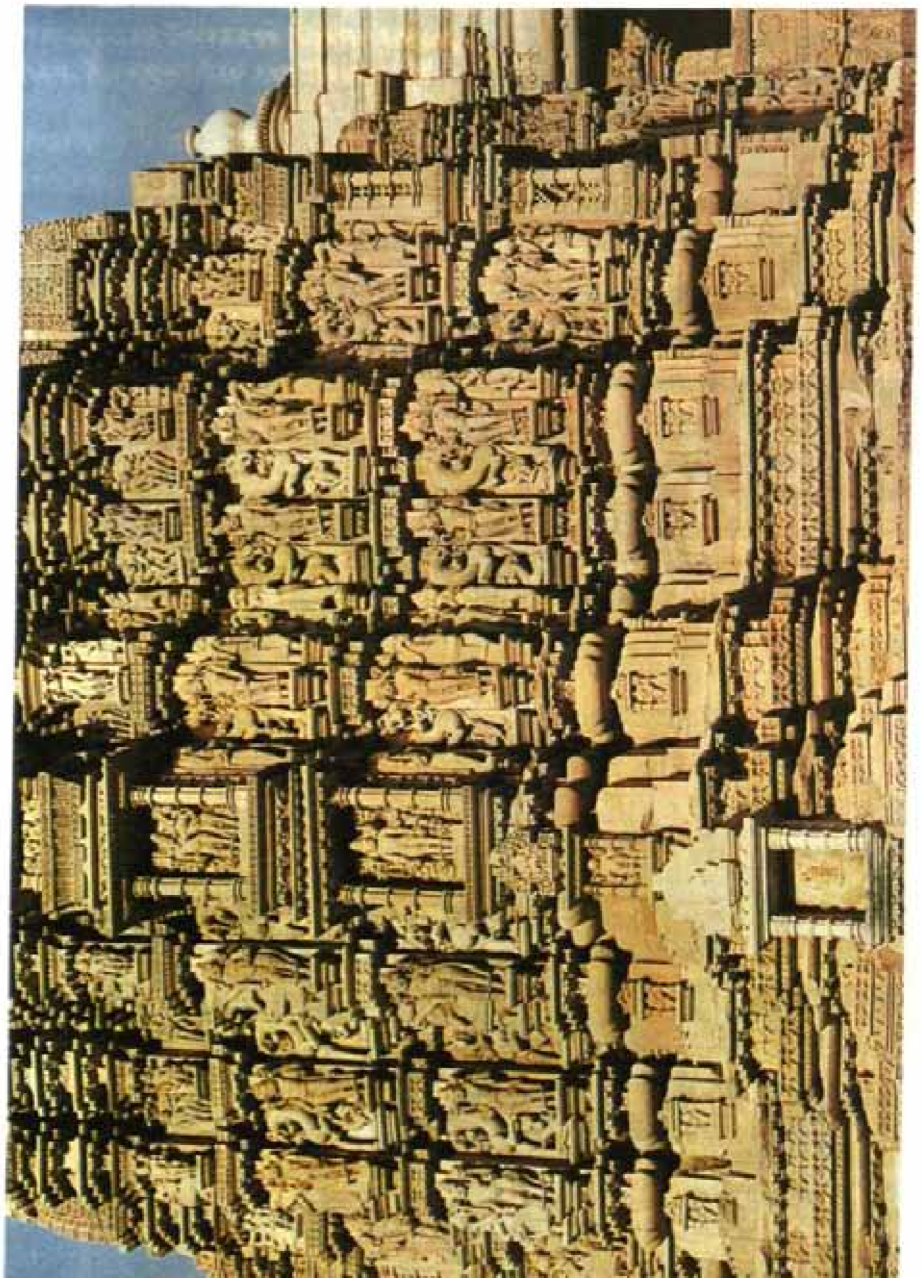
The mural paintings and relief figures in the Buddhist rock-cut shrines were chemically conserved during the period. The removal of the dust, dirt, mud, nests and cobwebs etc. was carried out from the painted mural surfaces, besides mounting and providing new supports to the detached paintings. Fumigation of cells along with monitoring of micro-climatic conditions inside the caves was done in order to study the optimum condition for insect activity and micro-biological growth. The relief figure of Buddha and Bodhisattva of Cave 2, suffering from recurring problem of excessive ground water seepage and salt

Plate 165



Devijagadambi Temple, Khajuraho : sanctum façade, affected by cryptogams, before chemical treatment

Plate 166



Devijagadambi Temple, Khajuraho : sanctum façade, after chemical treatment

efflorescence, continued to pose a serious threat to these unique sculptures of great artistic and historical importance. As part of its strategy to replace the damaged original figures, one pair of Bodhisattva was modelled using rubber in liquid form as the main moulding material. The other relief figure of doorkeeper at the entrance of sanctum was also reproduced by spreading technique. Finally, the finished cast made in fibre glass reinforced polyester resin was affixed to a polished *sal* wood frame for display.

43. TOMB OF MOHAMMAD GHAUS, GWALIOR, DISTRICT GWALIOR

In continuation of the previous year's *(1997-98,* p.342) work, the chemical conservation work of the sandstone perforated screen with exquisite lattice work was carried out. About 59% of the work was completed during the period.

44. ROCK PAINTINGS, ROCK-SHELTERS AT BHIM BETKA, DISTRICT RAISEN

Paintings in some of the Rock-shelters (nos. 6, 10,11 and 12) were subjected to chemical treatment and preservation work. The chemical cleaning was done by using suitable organic solvents followed by preservation with 2% polyvinyl acetate solution in toluene.

45. TEMPLE-COMPLEX 45, SANCHI, DISTRICT RAISEN

In continuation of the previous year's *(199* 7-*98,* p.342) work, the chemical treatment and preservation work of this ruined monument was completed.

46. GREAT STUPA, SANCHI, DISTRICT RAISEN

Restoration *of yakshi* figure on the right side was carried out to provide a new support in order to prevent the figure from being pulled down by its own weight. The missing portion of the leg was reproduced completely using fibre glass, reinforced polyester resin which ensured *in situ* conservation of sculptures and also aesthetic presentation. The reconstruction of the missing portion was done with analogy, based on the extant upper portion of the figure. The restoration work was accomplished through reconstruction as per the original clue (pls. 167-168).

47. BAJARMATH TEMPLE, GYARASPUR, DISTRICT VIDISHA

The chemical conservation work of this temple having exquisite carvings and sculptures on its exterior wall was carried out for the removal of heavy micro-vegetational growth and lime accretions, etc., using suitable chemicals. The stone surface was given fungicidal treatment followed by preservation. The work was completed during the period (pis. 169-170).

48. HLNDOLA TORAN, GYARASPUR, DISTRICT VIDISHA

The Toran gate and remains of this temple were chemically treated for the removal of thick micro-vegetational growth using aqueous solution of ammonia and non ionic detergent followed by fungicidal treatment with 2% suspension of zinc silico fluoride and 2% solution of sodium pentachlorophenate respectively. Finally, a preservative coat was applied over the cleaned and dried stone surface using 2% solution of PMMA in toluene.

MAHARASHTRA

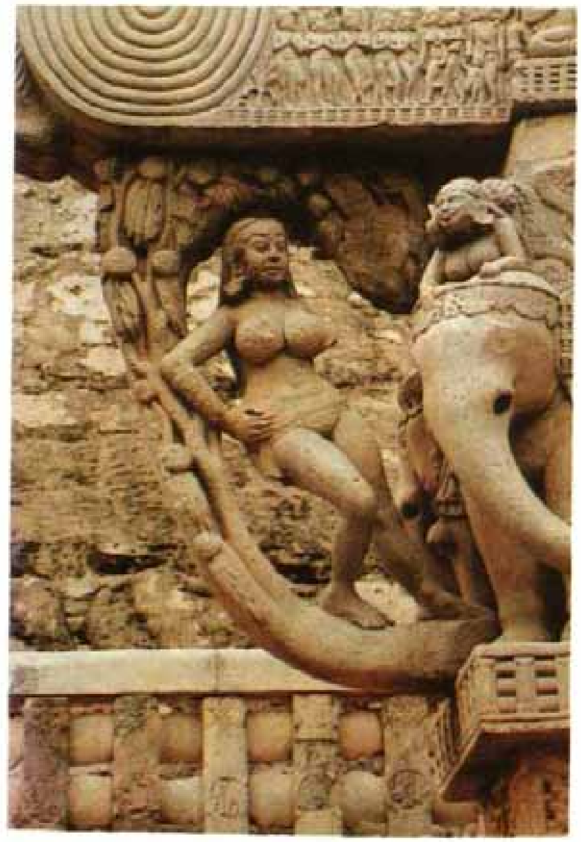
49. AJANTA CAVES, AJANTA, DISTRICT AURANGABAD

Fumigation was carried out in Caves 1 and 2 with Ethoxide gas as fumigant to control the insect

Plates 167-168



167



168

Great Stupa, Sanchi : figure of yakshi, 167, *before and* 168, *after restoration*

Plates 169-170



169



170

Bajarmath Temple, Gyaraspur : female figure on exterior wall covered with lichenous crust,
169, before and 170, after chemical treatment

and pest activities. The fumigant was allowed to remain in the airtight cave for long duration (about 36 hours) and various types of insects and harmful inhabitants such as silver fish, cockroaches, bats, rodents, lizards etc., were noticed dead due to lethal action of Ethoxide gas.

Spraying of insecticide was carried out regularly on the unpainted surfaces comprising an area of 2300 sq m using mixture of Pyrethrum 2% extract in solvent (Kerosene oil). This process was repeated twice in a month throughout the year.

Paintings on ceiling of central hall and anti chamber in Cave 2 and pillars in Cave 17 comprising an area of 25 sq m were subjected to chemical treatment and preservation for the removal of dust, dirt, soot accretion. After complete cleaning and drying, the paintings were preserved with 0.5 to 1.0% solution of polyvinyl acetate in toluene. The work was completed during the period under review.

The consolidation work of loose plaster and paintings, filling of holes, cracks, fixing of bulges and edges were carried out in Caves 1,2,17,19 and 21 using plaster of Paris mixed with fevicol and suitable earth colours to match the original mud-plaster for consolidation.

50. AURANGABAD CAVES (NOS. 1 AND 2), DISTRICT AURANGABAD

The chemical conservation of stone sculptures of Caves 1 and 2 was carried out for the removal of dust, dirt, bird's excreta and micro-vegetation on the exterior fagade of the cave with aqueous solution of ammonia and non-ionic detergent. Cracks and crevices were filled in with a paste of rock powder and suitable adhesive. 2% solution of sodium pentachlorophenate was sprayed as fungicide over the dried surface followed by preservative coat of 3% solution of PMMA in toluene. The work was completed.

51. BIBI-KA-MAQBARA, AURANGABAD, DISTRICT AURANGABAD

The chemical conservation work of stucco lime plaster and marble structure of main mausoleum was carried out during the period under review. The thick layer of dust, dirt, bat's excreta, oily and greasy accretions along with lime splashes were removed using suitable chemicals and solvents. Lime splashes and coats were removed by chemico-mechanical means. Marble structures were cleaned with clay pack method using some additives in different concentration in bentonite clay followed by thorough washing with water. Cracks and damages in stuccos were consolidated using possible known constituents of old stuccos of same texture.

The beautifully designed metal plates of old doors all around mausoleum were also cleaned with 5% aqueous solution of Rochelle's salt followed by preservation with 1% solution of PVA in toluene.

52. ELLORA CAVES, ELLORA, DISTRICT AURANGABAD

The chemical cleaning work of paintings of main shrine was carried out to remove the hardened oily soot, cemented dust, dirt and bat's excreta using suitable organic solvents like di-acetone alcohol, cellosolve Ethylene glycol, di-butyl phthalate, D.M.F., morpholine, methanol, toluene, butyl lactate, n-hexane etc. in suitable proportion and with little EDTA selectively for the removal of accretionary deposits. An area of 3.48 sq m was chemically cleaned and the work is in progress.

The chemical conservation work of the upper half exterior stone sculptures of main temple was carried out for eradication of thick layer of micro - vegetation, dust, dirt, bird's excreta etc., The consolidation of loose and fragile sculptures/paintings was also carried out. The chemical cleaning was done with 2-3% solution of aqueous ammonia and non-ionic detergent with gentle brushing using soft brushes. While calcareous deposits were removed with 1% aqueous solution of acetic acid followed by thorough washing with plenty of water. The cleaned and dried surface was given fungicidal treatment with 2% aqueous solution of PMMA in toluene. Fragile stone surface was sprayed with dilute solution of potassium methyl siliconate for preservation.

ORISSA

53. Meghesvara Temple, Bhubaneswar, District Bhubaneswar

The remaining 804 sq m area was subjected to chemical treatment and preservation. Thick layer of micro-vegetational growth was removed by using homogenous mixture of non-ionic detergent and ammonium hydroxide (1:3). The cleaned and dried stone surface was given fungicidal treatment with 2% solution of sodium pentachlorophenate followed by preservation with Repellin super and PMMA solution in toluene.

54. Ramesvara Temple, District Bhubaneswar

The outer stone surface of this temple comprising an area of 1960 sq m was subjected to chemical treatment for removal of thick vegetational growth using 3-5% solution of ammonium hydroxide and non-ionic detergent. After chemical cleaning 2% solution of sodium pentachlorophenate was applied as fungicide followed by a single coat of Repellin super and 1 % PMMA in toluene.

55. Paschima Somanatha and Kapilesvara Group of Temples, District Boudh

Four small temples made of red variety of sandstone in this complex were chemically treated and preserved during the period. The thick growth of micro-vegetation was eradicated by using suitable chemicals followed by thorough washing with water. The stone surface was given fungicidal treatment followed by preservation over the completely dried surface.

56. Ratnagiri Monastery, Ratnagiri, District Jajpur

The periphery wall and main stupa of monastery were chemically treated and preserved during the period. The micro-vegetational growth from the stone surface was removed by using 3-5% solution of ammonia and non-ionic detergent. The chemically cleaned and dried surface was subjected to fungicidal treatment followed by preservation with Repellin super and PMMA in toluene. The door-jamb, loose sculptures of the monastery were also chemically treated and preserved during the period.

57. Jagannatha Temple-Complex, District Plri

The stone surface of Bhubaneswari Temple in the complex, having an area of 513 sq m was subjected to chemical treatment for the removal of micro-vegetational growth along with other superficial accretions using ammonia and non-ionic detergent in 3:1 in aqueous medium. The surface was given fungicidal treatment followed by preservation. The work was completed during the period.

58. SUN TEMPLE, KONARAK, DISTRICT PURI

The *jagamohana* and other parts of the temple were chemically treated for the removal of thick micro-vegetational growth using aqueous solution of ammonia and teepol with soft brushing followed by thorough washing with water. On drying, the stone surface was given fungicidal treatment with 2% solution of zinc silicofluoride as fungicide. Finally, the preservative coat was applied twice using 1.5% solution of PMMA in toluene.

RAJASTHAN

59. SOMESVARA MAHADEVA TEMPLE, BHANGARH, DISTRICT ALWAR

The stone surface of the temple was subjected to chemical treatment for the removal of micro-vegetational growth using 3-5% solution of aqueous ammonia and non-ionic detergent with soft brushes. The stone surface was thoroughly cleaned with water followed by fungicidal treatment with 2% solution of sodium pentachlorophenate over the dried surface. Finally, the surface was preserved with double component system using potassium methyl siliconate in suitable concentration followed by 1 % PMMA in toluene.

60. FOUNTAIN AND PARAPET WALL, DEEG PALACE, DEEG, DISTRICT BHARATPUR

The chemical treatment and preservation of fountains and parapet walls were carried out for the removal of biological growth of moss, lichen, bacterial slime using mixture of 3-5% ammonia and 1 % non-ionic detergent with soft brushes. The chemically cleaned surface was given fungicidal treatment with 2% solution of sodium pentachlorophenate followed by 2 coats of 1% solution of PMMA in toluene as preservative on the dried surface. The work was completed during the year (pls. 171-172).

61. METALLIC GATE, BHARATPUR, DISTRICT BHARATPUR

In continuation of the last year's *(1997-98,* p. 348) work, the chemical treatment and preservation work of this metallic gate was continued for the removal of thick coat of green patina and other accretionary deposits of calcareous and siliceous matter using different chemicals and solvents *viz.,* sodium potassium tartaric acid and citric acid in different steps. The chemically cleaned metallic surface was preserved with a synthetic solution. The wooden portion of the gate after chemical cleaning with organic solvents was subjected to insecticidal treatment and minor gaps of losses were filled in. Finally, the entire wooden surface was preserved with 1 % polyvinyl acetate solution in toluene.

62. MAHAKALA TEMPLE, BIJOLIYA, DISTRICT BHILWARA

The work of chemical treatment and preservation of main *sikhara* (1 and 2) of this temple was taken up for the removal of biological growth, dust, dirt, bacterial slime and stratified lime coat from the stone surface of the temple. Biological accretions of micro-vegetation were removed by using 3-5% solution of liquid ammonia added with non-ionic liquid detergent in aqueous medium. Lime coat was removed by chemico-mechanical method using dilute solution of acetic acid and thorough washing with plenty of water.

63. CHITTAURGARH FORT, DISTRICT CHITTAURGARH

The exterior stone surface of Adbhutnatha Temple was chemically treated for the removal of micro-vegetational growth and other accretions using

Plates 171-172



171



172

Deeg Palace, Deeg, Bharatpur : fountain and parapet wall, 171, before and 172, after chemical treatment

3-5% solution of aqueous ammonia and non-ionic detergent. The chemically cleaned and dried surface was given fungicidal treatment with 2% solution of sodium pentachlorophenate followed by preservation with 1 % solution of PMMA in toluene. The work was completed during the period (pls. 173-174).

The exterior of north-east and south-west faces of the main *sikhara* and *mandapa* of the Samidhesvara Mahadeva Temple was subjected to chemical treatment and preservation. The micro-vegetational growth and other accretions were removed using 3-5% solution of aqueous ammonia and non-ionic detergent. Lime deposited within the carvings and beautiful designs was removed by chemico-mechanical method using dilute solution of acetic acid. The stone surface was treated with 2% solution of sodium pentachlorophenate/santrobite as fungicide followed by 2 coats of 1% solution of PMMA in toluene as preservative. The work was completed during the period under review.

64. LOOSE SCULPTURES OF KALYANPUR, DISTRICT UDAIPUR

Loose sculptures were chemically treated and preserved in order to remove accumulation of dust, dirt, stains of patina, greasy matter along with micro-vegetational growth and lime-wash etc., The accretions were removed using suitable chemicals. Different stains of paints, soot, vermilion and greasy matter were removed using organic solvents like acetone, methanol, isoamyl acetate and triethanolamine in suitable proportions. The sculptures were subjected to fungicidal treatment with 2% solution of santobite followed by preservation with 2% PMMA solution in toluene.

TAMILNADU

65. DENUPURISVARA TEMPLE, MADAMBAKKAM, DISTRICT CHENNAI

The chemical conservation work was undertaken for the removal of micro-vegetational growth from the exterior portion, stone sculptures in different locations in this monument as well as oily and sooty accretions from the pillars and walls of the monument. The micro-vegetational accretionary deposits along with oily and sooty accretions were removed from the stone surface using aqueous solution of ammonia and non-ionic detergent. The accretionary deposits like lime-wash, yellow ochre and red ochre of inorganic nature were removed by chemico-mechanical means using 10% solution of acetic acid. After thorough washing, the chemically cleaned surface was given a coating of 2% solution of sodium pentachlorophenate and finally on the completely dried surface, a preservative coat of 3% solution of PMMA in toluene was applied.

66. SHORE TEMPLE, MAHABALIPURAM, DISTRICT CHENGAI-ANNA

During the period under review, the Vimana of the main shrine and walls below it comprising an area of 414 sq m were taken up for chemical conservation.

The entire area was first cleaned for removal of dust, dirt and patches of vegetational growth using ammonia and teepol. The soluble salts were extracted by repeated application of salt free paper pulp. When the surface was free from soluble salt to the maximum possible extent,-the entire surface was washed with demineralized water to remove

Plates 173-174



173



174

Exterior of Adbhutnatha Temple, Chittaurgarh Fort: 173, *before and* 174, *after chemical treatment*

the adhering paper bits on the surface. Finally, 1.5% solution of sodium pentachlorophenate and 3% solution of PMMA in toluene were applied as fungicide and preservative.

67. SRINARASIMHASVAMY TEMPLE, NAMAKKAL, DISTRICT NAMAKKAL

The chemical treatment work for removal of dust, dirt, oily and sooty accretions as well as lime-wash, red ochre and yellow ochre from the walls, ceilings and pillars of Sri Narasimhasvamy Temple and Sri Ranganathasvamy Temple was taken up. Dust, dirt, oily and sooty accretions were removed using aqueous solution of ammonia and non-ionic detergent in the ratio of 3:1, whereas lime-wash and accretionary deposits of red and yellow ochre which were removed by using 10% solution of acetic acid. The chemically cleaned surface was given a preservative coating of 3% PMMA in toluene on the dried surface.

68. ROCK-CUT VISHNU TEMPLE, THIRUMAYAM, DISTRICT PUDUKKOTTAI

The chemical treatment of sculpture in different locations of this temple involved the removal of thick coat of lime using 10% solution of glacial acetic acid and removal of sooty and greasy accretions with aqueous solution of ammonia and non-ionic detergent in the ratio of 3:1. The accretionary free stone surface was applied a preservative coat of 3% solution of PMMA in toluene.

69. SRIAGASTYESVARAR TEMPLE, VELLANORE, DISTRICT PITH KKOTTAI

The accretionary deposits of hardened lime-wash and oily and sooty deposits from the pillars, walls and the inscription of interior portion were removed using 10% solution of acetic acid and 3:1 solution of ammonia and teepol respectively. The exterior walls, Vimana of main shrine and *gopuram* having micro-vegetational growth were also subjected to chemical treatment using amonia and teepol solution. The chemically cleaned areas were given fungicidal and preservative treatment as well.

UTTAR PRADESH

70. BULAND DARWAJA, FATEHPUR SIKRI, DISTRICT AGRA

The entire stone and plastered surface of Buland Darwaja covered with thick layers of moss, lichen and algae was subjected to chemical treatment using aqueous solution of ammonia and non-ionic detergent. These areas excluding the painted plaster were given fungicidal treatment. The application of preservative coats was carried out using two component systems in which the first coat of 1 % solution of Repellin Super was used and after a gap of a few days two coats of 2% PMMA in toluene were applied.

The painted plaster was carefully cleaned using different organic solvents separately or in different proportions as per the response of excretory deposits. The cleaned painted plaster was then preserved with 1% solution of polyvinyl acetate in toluene.

71. ITMAD-LD-DAULA, AGRA, DISTRICT AGRA

The marble surface and paintings on lime-plastered surface in the south-west corner of southern verandah and western verandah which had turned yellowish brown due to deposition of year old paniculate matter including smoke and soot were taken up for chemical treatment using exclusively organic solvents and their mixture in different proportions. The cleaned and dried painted plaster was finally given a coat of 1 -2% solution of polyvinyl acetate in toluene for preservation and consolidation of the pigments.

72. MARYAM'S PALACE, FATEHPUR SIKRI, DISTRICT AGRA

The painted plaster at many locations in Maryam's Palace have bulged portions flaking at the edges. To prevent the loss of these painted plaster, the bulged portions were secured to the ground by injecting fixatives and the flaked edges were filleted with plaster of Paris. Minor colour reintegration of its low tone of the filleted areas was also carried out.

73. MUSAMMAN BURJ, AGRA FORT, DISTRICT AGRA

The paintings on the marble surface in the Musamman Burj (exterior and interior) had become yellowish brown due to the deposition of age old dust, dirt, somke, soot and other particulate matter. The metallic dome of the structure had tarnished giving blackish appearance. The general chemical treatment of marble surface of the structure was carried out by clay pack technique using Fuller's earth followed by cleaning with ammonia and non-ionic detergent and finally washing with distilled water. The chemical cleaning of paintings on the marble surface in the interior of this Burj was carried out with great care and caution using mixture of mild organic solvents in different proportions. The painted surface was finally preserved with 1 % solution of polyvinl acetate in toluene.

The metallic surface of the dome was subjected to chemical treatment using alkaline rochell's salt.

74. TAJ MAHAL, AGRA, DISTRICT AGRA

The red sandstone wall on east and west facing Taj Mahal, covered with micro-vegetaional growth and dust deposition were subjected to chemical treatment using aqueous solution of ammonia and non-ionic detergent. The cleaned areas after thorough washing with water were given fungicidal treatment and finally on the completely dried stone surface two coats of 2% PMMA in toluene was applied.

75. GROUP OF TEMPLES, JAGESVARA, DISTRICT ALMORA

The micro-vegetational growth along with dust and dirt deposited on the exterior of these temples on the right wing was removed with mild solution of liquor ammonia and non-ionic detergent. After thorough washing with water, fungicidal treatment was given and finally a preservative coat of 2% solution of PMMA in toluene was applied on the dried surface.

76. GROUP OF TEMPLES, PANDUKESVARA, DISTRICT CHAMOLI

Thick micro-vegetational growth, dust, dirt and other accretions like bird's excreta and suspended particulate matter were removed using aqueous solution of ammonia and non-ionic detergent. Fungicidal treatment was given over the completely dried surface followed by preservation with 2% solution of PMMA in toluene. The work was completed.

77. MAIN STUPA, KUSHINAGARA, DISTRICT PADRAUNA

The main stupa was subjected to chemical treatment with solution of aqueous ammonia and non-ionic detergent for the removal of micro-vegetational growth. Fungicidal treatment was given to the clean and dried surface with 3% solution of sodium pentachlorophenate. Preservation work was done with Repellin super followed by 2% solution of PMMA in toluene. The work was completed during the period.

78. PARINIRVANA BUDDHA, KUSHINAGARA, DISTRICT PADRAUNA

The statue platform and marble boundary of the monument were chemically cleaned with organic solvents like rectified spirit, triethanolamine and toluene, etc. Fungicidal treatment was given over the completely cleaned and dried surface. Consolidation and preservation work was done with PVA solution in toluene with gold powder at some places. The work was completed in all respect.

79. BRAHMANICAL SHADE, SARNATH-COMPLEX, SARINATH, DISTRICT VARANASI

The chemical treatment and preservation of loose stone sculptures were carried out with aqueous solution of ammonia and non-ionic detergent to eradicate the micro-vegetational growth and other accretions. 5% solution of sodium pentachlorophenate was sprayed as fungicide followed by consolidation and preservation with Repellin super and 2% PMMA solution respectively.

80. EXCAVATED SITE, SARNATH, DISTRICT VARANASI

The chemical treatment and preservation work of votive stupa situated on the right side, extension and north-west side of Dhamekh Stupa were carried out during the period. Thick layer of micro-vegetational growth was removed by using aqueous solution of ammonia and liquid detergent by gentle scrubbing with soft nylon brushes. The chemically cleaned surface was subjected to fungicidal treatment with 5% solution of sodium pentachlorophenate and on the completely dried surface 2% solution of PMMA in toluene was applied as preservative and consolidant.

WEST BENGAL

81. JOR MANDIR GROUP OF TEMPLES, BISHNUPUR DISTRICT BANKURA

Thick layer of moss, lichen and fungi was removed by using 5% solution of aqueous ammonia and non-ionic detergent using soft brushes. Fungicidal treatment was given with 3% solution of sodium pentachlorophenate to the dried stone surface. The consolidation work was also carried out followed by preservation with 2% solution of PMMA in toluene.

TREATMENT OF EXCAVATED OBJECTS AND MUSEUM EXHIBITS[1]

1. The Persian carpets having beautiful designs displayed in Gopal Bhawan, Deeg Palace, Deeg, Rajasthan, have accumulated lots of dust and dirt besides greasy stains at some places, were also observed. Initially, the dust and dirt, to a great extent was removed with the help of vacuum cleaner and the greasy stains were locally removed using mixture of organic solvents *viz.,* alcohol, acetone, amyl acetate, etc. The carpets were also subjected to ammonia fumes in a closed room with a view to neutralize any acidity that might have developed. The carpets were fumigated with thymol in airtight room

[1] Information from : Director (Science), Dehradun, of the Survey.

and once again were cleaned with vacuum cleaner. To prevent any insect activity in future as a precautionary measure the para-dichlorobenzene was placed in small sachets below the carpets, near the edges of the carpets under which the polythene sheet was placed. For future protection and to avoid further accumulation of dust, dirt, a transparent polythene was placed over the carpets.

2. Sixteen antiquities of Hazardwari Palace Museum, Murshidabad, West Bengal, were chemically treated and preserved using different suitable chemicals depending upon the nature of the objects and the accretionary deposits by standardized treatment methods. These include three paintings, one armour, three Porcelain items, one glass with brass, five marble statues, one stone, glass and brass object, one each.

3. Twenty-six lead coins from the excavated site of Sannati, Gulbarga, Karnataka, received from Bangalore Circle of the Survey, were chemically treated and preserved using suitable chemicals.

4. One hundred and fifty copper coins received from Director (Epigraphy), Mysore and fifty copper coins received from Thrissur Circle of the Survey, Thrissur, were chemically treated and preserved using alkaline Rochelle's salt and 1 % PVA solution in toluene respectively.

5. In continuation of the last year's *(1997-98,* p. 355) work, the de-acidification of Estampages was done using alcoholic barium hydroxide solution repeatedly till the pH value 7. Estampages were mended and strengthened by strip lining. Finally preservation work was carried out using PVA solution in toluene. During the period under review, 37.6 sq m area of Estampages were treated and preserved.

6. A manuscript from Mumtaz Mahal, Red Fort Museum, Delhi, was chemically treated and preserved.

7. Brass and copper pots received from the excavated site of Rakhigarhi, Hissar, Haryana, were opened for display at the Harappan gallery, National Museum, New Delhi.

8. The holy Quran received from Red Fort Museum, Delhi, was de-acidified and fumigated with suitable chemicals. The leather bound cover was completely restored and reintegrated.

MONITORING OF AIR POLLUTION

1. The air pollution monitoring station at Taj Mahal, Agra, was continuously monitoring the levels of various gaseous pollutants and particulate matter. The sulphation rate and certain metrological parameters that have direct bearing on the diffusion of the gaseous pollutant or may facilitate the action of these pollutants on the building materials were monitored.

A. Wind speed and direction provide valuable information about the direction and distance of the pollutants transported after being airborne. Wind speed and direction around the Taj Mahal were determined with the help of wind monitor (WM-200). During the period under review, the Taj Mahal experienced light air to gentle breeze

[1]Information from : Director (Science). Dehradun, of the Survey.

(monthly average) with a few exceptions of dust storms in summer. The wind direction during most of the time was observed to be from north-west. The wind speed was measured in kilometres per hour.

B. Temperature and relative humidity are two important secondary factors responsible for dilution and dispersion of various pollutants, were measured in the vicinity of monuments periodically. These are also responsible for interaction of the pollutants with the object and governs the rate of chemical weathering. Large variation in temperature and relative humidity creates stress into the stone matrix which may result into cracks or bulges. Large variation in temperature and humidity was recorded during the period.

C. Dust fall rate: dust particles are responsible for abrasion. The dust fall rate was recorded in metric tonnes per square kilometre as maximum in May 1998 and minimum in August 1998. Volatile matter of dust fall was also estimated and recorded during the period.

D. Suspended particulate matter: suspended paniculate matter, a finer dust which remains airborne for a longer period was measured using High Volume Sampler and Respirable Dust Sampler. The concentration of suspended particulate matter was determined in ug/m' of air.

E. Sulphur dioxide and oxides of nitrogen: sulphur dioxide and oxides of nitrogen are reactive with marble to a great extent causing harm due to formation of their respective acids. The concentration of SO_2 and oxides of nitrogen was measured in terms of ugm/m^3.

F. Sulphatation rate: sulphur dioxide gas gets converted into sulphuric acid through various mechanisms in presence of catalyst, present in the environment through an intermediate, transition reaction, i.e., formation of sulphur trioxide. The sulphation rate was measured during the period by lead candle method and values are expressed in SO_3 /m^2/day.

G. Air Pollution Index : the cumulative action of various pollutants in the atmosphere is more deterimental to a monument than to the action of any individual pollutant. Air pollutant index was calculated to study the cumulative effect of harmful pollutants during the period under review. API was highest being in May 1998 being 713.67 though the average API for the year was 78.03. The major reason for the high API may be attributed to the particulate matter due to climatic conditions of the Agra region and also to its geographical location.

2. Monitoring of micro/macro climatic parameters around Gomatesvara Statue, Sravanabelagola, District Hassan, Karnataka, was carried out with the installation of instruments like thermohygrographs, wind vane, cup anemometer, rain gauge, for recording of ambient temperature, humidity, wind directions, wind speed and rain fall over the period. During the period under review, above instruments were procured and installed at the site for periodical monitoring of micro climate.

RESEARCH AND ANALYSIS[1]

1. A plaster sample used in the past restoration work for relining of a canvas oil painting from Hazarduari Palace, Murshidabad, West Bengal, was examined and studied under scanning Electron Microscope for its morphological characteristics.

2. Eighty-seven soil samples received from excavated site of Rakhigarhi, District Hissar, Haryana, were analysed mechanically (Sieve analysis) to find out the nature of soil as well as chemically to ascertain the various inorganic radicals present in them.

3. The lichen samples from Sdn Temple, Konarak and Megeshwar Temple, Bhubaneshwar, Orissa, were studied in detail by SEM and ultra violet spectrophotometer, extracting their lichanic substances in acetone, ethanol and water respectively for their identification and characterization.

4. A tiger skin received from Gorkha Rifles, Dehradun, Uttar Pradesh, was chemically treated and fumigated for its preservation.

5. Eight stone samples received from Akbar's Tomb, Sikandara, Agra, Uttar Pradesh, were studied under Scanning Electron Microscope for their geological and surface characteristics and with infra red spectrophotometer for identification of oxalates due to epilithic activity of vegetational growth on mosaic work.

6. A charred wood sample form excavated site of Rakhigarhi, District Hisar, Haryana, was analysed and studied using SEM and IR Spectrophotometer.

[1]Information from : Director (Science), Dehradun, of the Survey.

IX. ARCHAEOLOGICAL GARDENS[1]

During the period under review, the Horticulture Branch of the Survey carried out the work of maintaining one hundred and fifty gardens in addition to the preparation and develoment of thirty-eight more

ANDHRA PRADESH

MONUMENTS, ANPU, DISTRICT GUNTUR

For landscaping and developing a garden around the monuments, the uneven ground was levelled after packing the ground, clearing all weeds and turning the soil.

DELHI

2. QUTB MINAR, HUMAYUN'S TOMB AND RED FORT, NEW DELHI

The work of returfing of lawns was taken up at Qutb Minar, Humayun's Tomb and Red fort, New Delhi. The work is under various stages of progress.

KARNATAKA

3. GROUP OF MONUMENTS, HAMPI, DISTRICT BELLARY

During the period under review, the Garden Branch of the Survey undertook the work of augmentation of water for irrigation in the Hampi complex besides making arrangements for lifting water from the Akka Tangi Gundu waste wear.

RAJASTHAN

4. ANASAGAR BARADARI, AJMER AND DEEG PALACE, DEEG, DISTRICT BHARATPUR

The work of returfing the lawns was taken up at Anasagar Baradari, Ajmer and Deeg Palace, Deeg in Rajasthan. The work is under progress.

UTTAR PRADESH

5. MEHTAB BAGH, AGRA, DISTRICT AGRA

The plantation work by following the Charbagh pattern of Mughal Gardens and periodic flora as per the direction of the Hon'ble Supreme Court was completed. The renovation of hedges in the forecourt of Tajmahal was completed. The returfing of lawns at Maryam's Tomb garden was completed. The garden development work at Dilkusha Palace is under progress.

WEST BENGAL

6. KOCH BIHAR PALACE, KOCH BIHAR, DISTRICT KOCH BIHAR

The first phase of Garden development of Koch Bihar Palace, Koch Bihar, was completed.

[1] Information from : The Chief Horticulturist, Horticulture Branch of the Survey, Agra.

X. PUBLICATIONS

PUBLICATIONS OF THE SURVEY

During the period under review, the Survey apart from compilation, editing and making *IAR1993-94 and 1994-95* press-ready for printing, initiated the publication of a new series *viz.,* the Inventory of the Monuments & Sites of National Importance under the Archaeological Survey of India. In this series seven volumes with twenty-two parts have been planned and the preparation of each volume is under progress.

1. INVENTORY OF CENTRALLY PROTECTED MONUMENTS

In this year, the Inventory of Monuments and Sites of National Importance (Vol. I, part 1) under the Chandigarh Circle was brought out.

2. SPECIAL PUBLICATIONS

Three brochures *viz.,* Monuments of World Heritage in India; 50 years of Excavations at Harappan Sites in India and Buddhist Sites in India were brought out by the Survey to celebrate the fifty years of India's Independence.

The Survey also undertook the work of reprinting of out-of-stock publications under the various series. The details of which are as under.

3. MEMOIRS OF THE ARCHAEOLOGICAL SURVEY OF INDIA

During the period under review, twenty-two issues (Nos. 16,17, 19,20,21,22,24,26,27, 29, 31, 32, 33, 34, 36, 37, 38, 39, 40, 41, 44 and 45) were taken up for reprinting.

4. GUIDE BOOKS

Three guide books *viz.,* Fatehpur Sikri, Hampi and Konarak were reprinted.

5. CORPUS INSCRIPTIONUM INDICARUM

Vol. IV, part II (Inscription of the Kalachuri-Chedi Era) was also reprinted.

6. ANNUAL REPORT ON INDIAN EPIGRAPHY

The Epigraphy Branch, Mysore, of the Survey, brought out three issues for the year *1987-88, 1992-93* and *1993-94.*

7. EPIGRAPHIA INDICA

During the year, the Epigraphy Branch, Mysore, also brought out Vol. XL, pt. VII under the series.

8. GUIDE TO EPIGRAPHY GALLERY

During the period under review, the Epigraphy Branch, Mysore, published a Guide to the gallery.

9. OTHER PUBLICATIONS

Guwahati: The Government Museum, Guwahati, published a *Catalogue of stone sculptures* during the year.

ARCHAEOLOGICAL SURVEY OF INDIA

